Best Energy and Space Saving Best RAID
Portable RAID 6, 2.5”HDD×6・Desktop Model

BIOS

BR256

― eSATA＋USB3.0 model ―

【 User Manual 】

Revision 1.01f

Safety Warning

■ In order to avoid injury to oneself, equipment, and others, please heed the following instructions.

■ The following indications explain the degree of physical danger possible by ignoring the proper usage directions.

⚠ **WARNING**	This symbol is used to indicate sections that may result in a serious injury or even death.
⚠ **CAUTION**	This symbol is used to indicate sections that might pose a risk of minor injury or physical damage.

The various types of warning symbols are listed in the following picture.
（The following provide examples of the warning drawings.）

	This symbol means that you should pay extra attention.
	This symbol indicates something you absolutely must not do.
	This symbol indicates necessary actions you should take.

Prefix

Thank you for choosing our product: Best RAID 256 eSATA+USB3.0 (BR256 hereunder).
This user manual contains features, functions, setup, and warnings, so please read this manual prior to use our product.
If any material in this manual is not clear, please contact manufacturer or vender where it was purchased.

- The information in this manual is subject to change without prior notice.
- It is prohibited to reproduce any part of this manual in any form or by any means without prior written permission of the manufacturer and the author.
- Manufacturer assumes no liability or responsibility for any error that may appear in this manual. In case issue raised please contact manufacturer or vender where this product was purchased.
- All trademarks stated in this manual are the properties of their respective owners.

HDD Installation

■ Install and Remove HDD Module

① Before you start any operation, please make sure HDDs are installed properly into the BR256 enclosure
② An alarming beep sound will be turned on and caused error if right number of HDD module was not installed properly
③ The system can be used only if the Array parameters have been set up properly.

■ Remove HDD Module

①Insert the key into the lock hole and turn the key counterclockwise.

② Push the lever of canister

③ Pull out the lever and hold the canister to remove HDD module

■ Install HDD Module

① Insert the HDD module

② Push the module into the enclosure and close the lever

③ Insert the key and turn it clockwise to lock the module.

There are 4 screw holes on each HDD module. Use screws in accessory pack to screw HDD on the module.

Precautions for Product Usage

■ **Treatment**

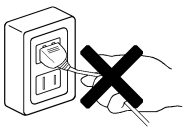
WARNING

Don't

- **Don't open up the cabinet.**
  You can be electrocuted.
- **Don't take it apart.**
  There is a chance to cause fire or injury
- **Don't modify.**
  There is a chance of fire.
- **Don't open the fan cover**
  There is a chance of injury

⚠ CAUTION

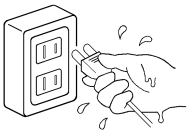
- **Make sure to hold the plug when inserting or removing power cable.**
  There is a risk of electrocution.
- **Don't pull on the cable itself.**
  There is a chance of fire.



- **Never operate unless the power plug is fully inserted.**
  It may short out and generate excessive heat, causing risk for a fire.

Don't

- **Never insert or remove the cable with wet hands.**
  You may be electrocuted.
- **Don't remove the drive unit with your fingernails.**
  There is a risk of injury.



- **When inserting disks don't put your fingers in the unit case.**
  There is a risk of injury.

⚠ CAUTION

- **When removing the drive unit, be sure to use both hands.**
  You may drop it, causing injury.
- **Never shut off the power while the drive is being accessed.**
  It may cause abnormal operation.
- **Never remove the disk unit while it is being accessed.**
  It may cause abnormal operation.
- **Use the original packing when transporting the unit.**
  It may fall and be damaged by shocks and impact.

Don't

- **Keep your hands and fingers away from the fan when the case is opened.**
  There is a risk of electrocution, fire, and injury.
- **Don't rub on edge of metal chassis.**
  There is a risk of injury.
- **Don't step on the unit.**
  There is a risk of injury and breakdown of the product.

● **You cannot change the order of the drives once the RAID mode has been established**
Please use the six drives in the order that they were installed at time of RAID creation.

● **Please be sure to make proper backups of all data periodically**
We do not guarantee data stored on HDDs. There might be risk due to software error or mishandling causing data lost or broken. It is always recommended to back up your data periodically.

● **Never use volatile chemicals (such as White Gasoline) or paint thinner**
It may cause damage to the color or shape of the item.
If it does get dirty, please clean with a soft cloth and alcohol or soap.

● **The unit is sensitive to sudden changes in temperature or humidity**
If the unit runs overheat, please be sure to cease operation until the conditions return to normal.

■ Placement

WARNING

- **Always use two hands when moving or transporting unit.**
  Injury can be caused if the item is dropped.
- **Place the unit in an area that can sufficiently support its weight.**
  There is a risk of injury.
- **Use a three-pronged outlet.**
  There is a risk of electrocution.
- **Don't use in places of extreme heat.**
  There is a risk of fire.

Don't

- **Don't use in very dusty or damp places.**
  There is a risk of fire.
- **Don't place in slant or unstable places.**
  It may fall and break, and may cause injury.
- **Never use with more than the rated voltage.**
  There is a risk of electrocution.
- **Don't use the cable in anything but the approved power terminal.**
  There is a risk of injury.
- **Don't attempt to damage, repair, or burn the cable in any way.**
  If the power cable becomes damaged there is a risk of fire or electrocution.

⚠ CAUTION

- **Don't place the item in very hot places or in direct sunlight.**
  The room's temperature may rise causing risk of damage.
- **Never let the power cord get near a heater.**
  The coating on the cord may melt causing risk of a fire or electrocution.

⚠ WARNING

- **Turn the power switch off while connecting power cord.**
  There is a risk of electrocution.

- **Remove the power plug upon any malfunction or breakdown.**
  There is a severe risk of fire or damage if you see smoke or smell any strange scents coming from the unit. Power down at once and contact the store where unit was purchased from.

- **Never let the unit be near any magnets or equipment containing magnets.**
  You may lose data from the hard disk.

Don't

- **Do not leave the HDD module unlock**
  There is risk that HDD module falls out of the enclosure

- **Never place the unit in any bags or containers containing liquids.**
  There is a risk of fire inside the unite, or electrocution

- **Keep the unit away from any shocks or vibrations.**
  The disk may sustain damage.

- **Please do not use the unit while another high-power unit is on the same power circuit.**

- **Do not use the unit in areas of high heat or humidity.**

- **Keep the unit away from televisions, radios, speakers, or any unit containing a magnetic field.**

- **Don't use the unit in any areas where liquid may get inside of it.**
  If liquid ever gets inside the case, remove the power cord at once.

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Chapter 1. BR256 Outline

1.1 Features

- Cable-less integrated RAID system
- Support six hot-swappable SATA hard disks
- Support RAID-6、RAID-0、RAID-3、RAID-5、RAID-1、RAID-1 3 DRIVE、RAID 10
- Support eSATA, USB3.0 and USB2.0 Interface; eSATA：3Gbits/sec (Theoretical value), USB3.0：5Gbits/sec (Theoretical value), USB2.0: 480Mbits/sec (Theoretical value)
- Pure hardware based RAID-6/3/5 parity generator and high speed DMA
- 32 Bit RISC Processor 200MHz/400MIPS for command processing CPU
- LCD and keypad operation for status monitoring and system configuration
- Buzzer Alarm for fault indication
- Fault LEDs for drives and controller error indication
- Dual host and two LUNs support
- Spot Recovery Rewrite Function

1.2 Function

- eSATA：3Gbits/sec, USB3.0: 5Gbps/sec, USB2.0：480Mbits/sec
- Support RAID-6、RAID-0、RAID-3、RAID-5、RAID-1、RAID-1 3 DRIVE、RAID 10
- Priority configuration of Rebuild
- Adjustable cache size
- Write cache mode setup
- Verify mode setup
- LU（Logical Unit）Division Capability
- Adjustable RAID-5/6 Parity Strip size
- Data readahead setup
- Write Retry mode setup
- Buffer segment size setup
- Beginning time setup of Retry
- Sequential list setup
- Sequential read ahead setup
- Cache management configuration
- Detection time of low speed drive setup
- Power On standby time setup
- Drive Ready waiting time setup
- Check time of cache memory setup
- HDD Patrol setup
- Patrol waiting time setup
- Error message emailing SMTP support
- SNMP Trap Support

＜Auxiliary Function＞

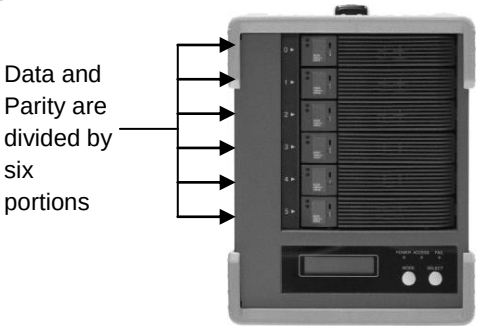
- Performance (Data transfer rate) reading on LCD
- Drive channel retry display
- 100Mbps Ethernet Port for Web-based status monitoring

1.3 RAID Mode Explanation

⚠ CAUTION

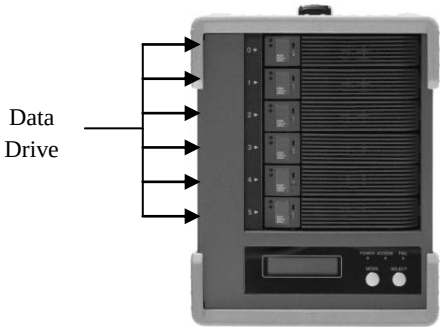
- **Any change of RAID mode will cause data rebuild and data lost.**

① RAID MODE 6



Comparing with RAID- 5 dual parity is applied providing even higher reliability
Allow up to two drives failure but also scarify capacity of two drives

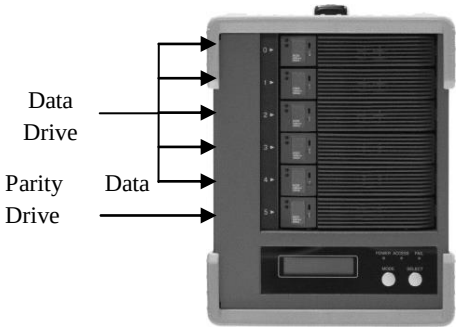
② RAID MODE 0



All drives are used for data recording
Data is segmented and equally distributed among 6 drives.
All 6 drives will be accessed while data is read or written.
The mode provides the highest performance among all others.

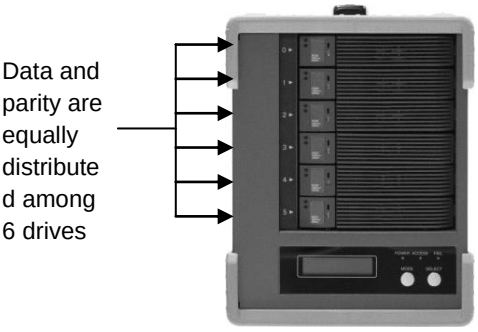
At the same time, if one drive failed, the whole data will be lost.

③ RAID MODE 3



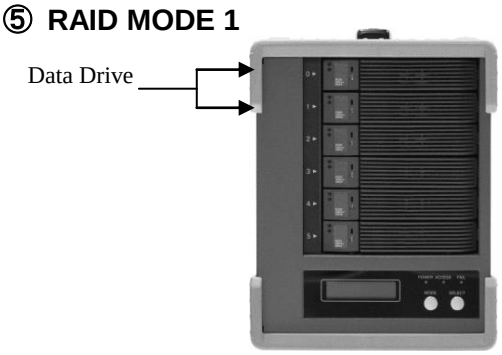
The most bottom drive is used for Parity
It allows one drive failure while data is accessing.
The data residing in failed drive can be generated from the rest of 5 drives

④ RAID MODE 5



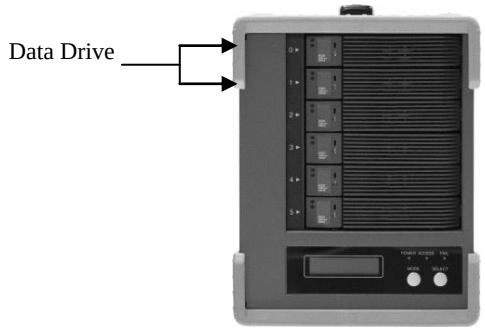
Data and Parity are distributed among 6 HDDs. Since there is no assigned disk for parity, each drive shares the same loading in data access.

⑤ RAID MODE 1



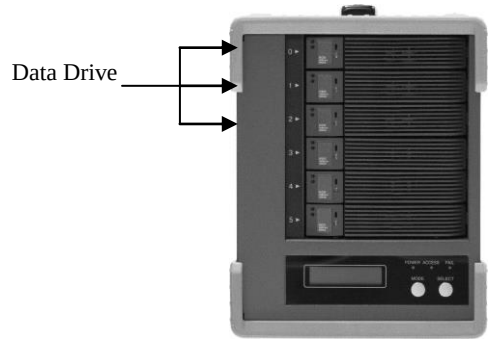
In general, Data at RAID 1 is written to two drives at the same time and read from one or both of drives.
Capacity is half the of the total physical disk capacity

⑥ RAID 0 - 2 DRIVE MODE



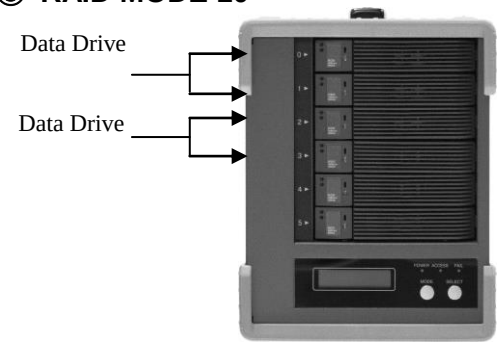
Only two drives RAID-0 mode. (The rest of four drives cannot be used)
There is no parity so the data cannot be recovered if any of drive fault.

⑦ RAID 1 - 3 DRIVE MODE



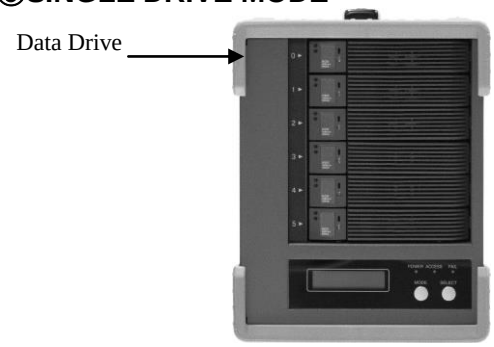
Three drive mirroring mode. Similar to RAID MODE1, Data is written to all of three drives and read only from one or two drives. Even two drives failed, the data can still be accessible.
The rest of three drives cannot be used.

⑧ RAID MODE 10



It is the combination of RAID-0 and RAID-1. Performance and security can be raised.
Stripe across mirrored Drive 0, 1 and Drive 2, 3
Capacity is equal to 2 drives capacity. Data can be accessed even one of both mirrored pair drives failed. The rest of two drives cannot be used.

⑨SINGLE DRIVE MODE



Only one drive is used. Data cannot be recovered if the drive is failed

1.4 Contents of Packing

Please inspect if accessories are all included when the package is opened.
If you found missing items, please contact your reseller. And please keep the original packing carton and materials.

＜BR256 Accessories＞

☐ BR256

☐ AC power cable × 1

☐ eSATA cable and USB3 cable

☐ Drive Key

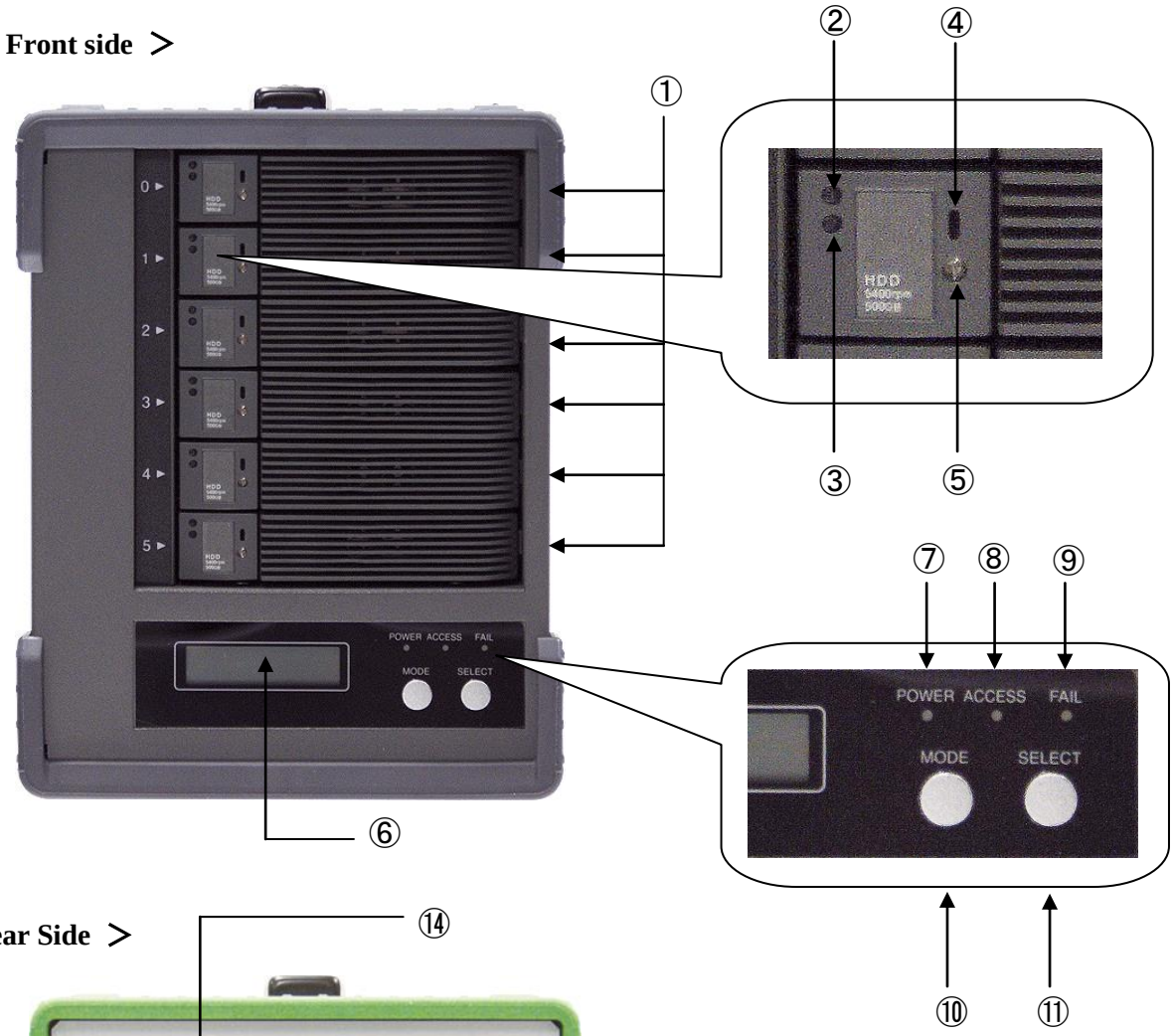
☐ Quick Installation Guide

Best Energy and Space Saving RAID System.
Portable RAID6, 2.5" HDD×6 • Desktop Model
BIOS
BR256B3
Quick Installation Guide
– eSATA+USB3.0 model –
BR256B3 model
◆ Introduction
This Quick Installation Guide(QIG) describes the packing content and installation guide line for BR256B3/eSATA+USB3.0 model.
It also explains the function of each connector, button and RAID mode.
It is served as a quick startup for basic configuration, and the details can be found on User Manual (CD-R).
Attention
BIOS and its resellers are not liable for any data or information lost or possible software issue to use the product. We do not take any responsibility of damage and/or systemmalfunction due to our product / storage device failure or for any of the problems caused as a result It is recommended to always backup your data.

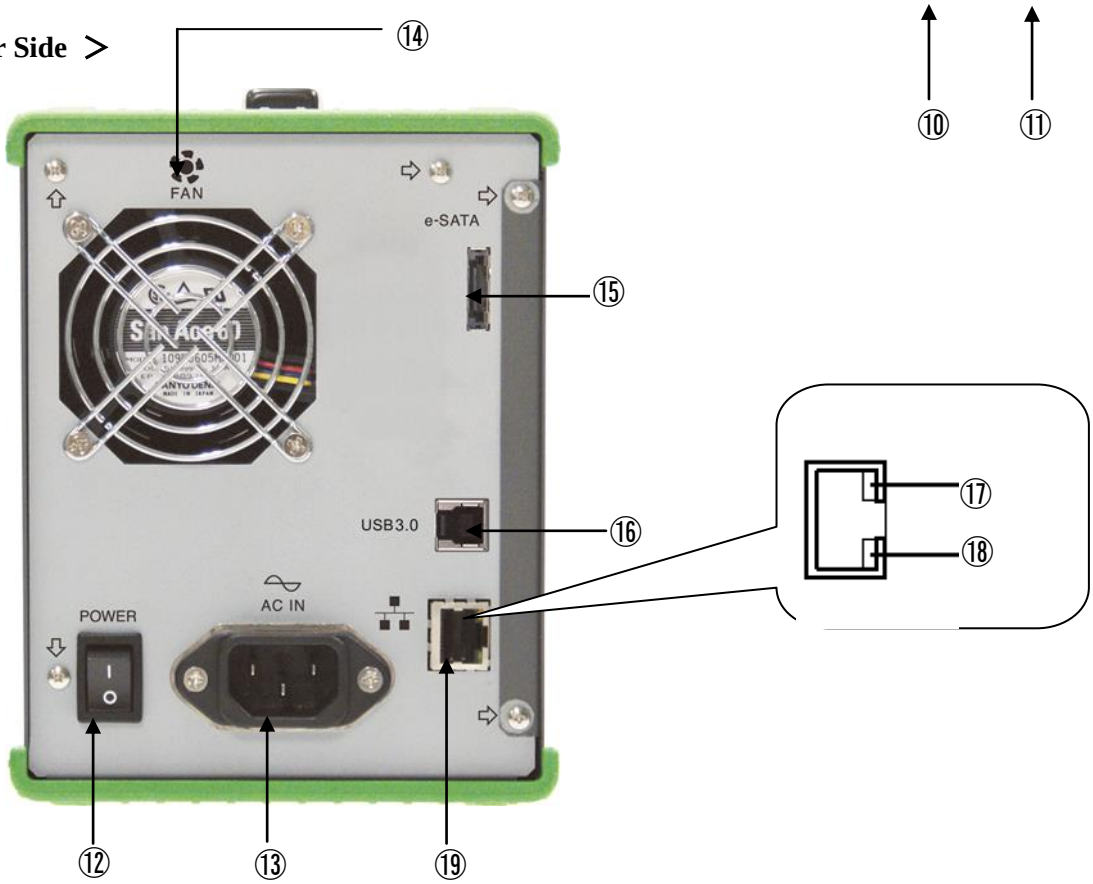
☐ User Manual （ CD-R ）

1.5 Name and Function of each part

＜ Front side ＞



＜ Rear Side ＞



No.	Name	Function
①	HDD Module	Hot-swappable drive module from top No.0、No.1、No.2、No.3、No.4、No.5
②	HDD POWER / FAIL LED	HDD Power LED: Blue when ON, and Amber if the drive failed When 「RAID-x RECOVERING 0%」 shown on LCD, the FAIL LED on means the HDD is under rebuilding
③	HDD ACCESS LED	Green Flash indicates HDD being accessed
④	Lock Indicator	Orange indicates HDD module was locked Gray indicates HDD module was unlocked
⑤	Key	Turn clockwise to lock the HDD module. Check the lock indicator to see the status of module.
⑥	LCD	Display of BR256 status or parameter
⑦	POWER LED	Blue when system is turned on.
⑧	ACCESS LED	Green flash, when accessing the controller
⑨	FAIL LED	Orange ON when a pre-defined error encountered
⑩	MODE Button	1）Parameter Initialization (press upon power on) 2）Parameter setup. See Chapter 2 3）Stop buzzer alarm(press to turn off buzzer)
⑪	SELECT Button	Parameter setup
⑫	POWER Switch	Switch system power on/off
⑬	AC Connector	Connect AC Cable
⑭	FAN	Cooling fan
⑮	eSATA Connector	Host e-SATA connection
⑯	USB3 Connector	Host USB3.0 connection
⑰	Ethernet Link LED	Orange ON indicates Link is setup
⑱	Ethernet Speed LED	10Mbps Off,Green On for other speed
⑲	LAN Connector	Connect to Ethernet for web management

1.6 Connection

- **Do not expose the unit under high temperature or directly sun light**
  For normal operation, adequate air condition to cool the unit is necessary

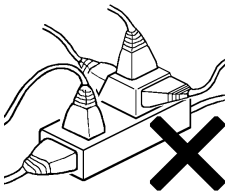
- **Never shut off the power while the drive is being accessed.**
  It may cause abnormal operation

- **Do not use the unit over or under power input range**
  Unstable power input might cause the system unusable or malfunction

- **Never insert or remove the cable with wet hands.**
  You may be electrocuted.

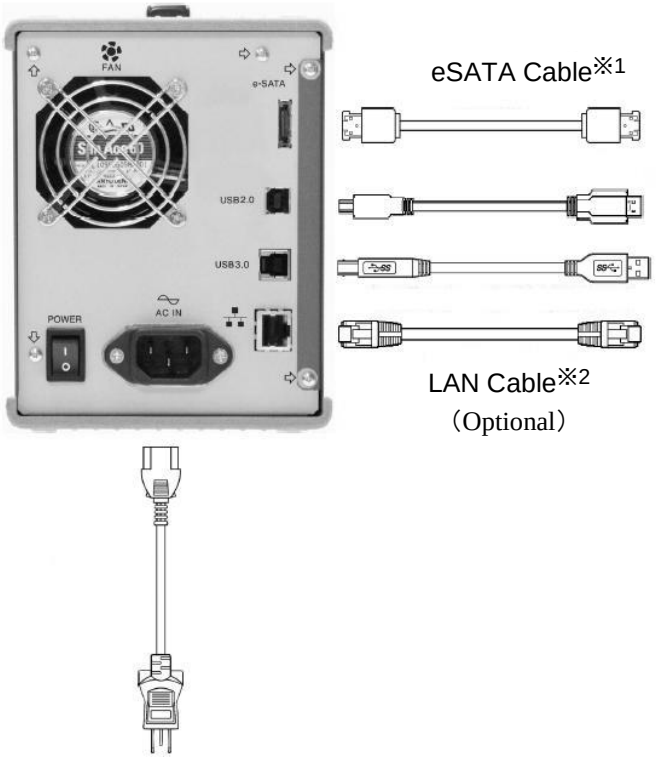
- **When removing the drive unit, be sure to use both hands.**
  You may drop it, causing injury

- **Do not share the power plug with other high power device**



- **Do not force the plug into the connector.**

  Please make sure the connector type correct before insertion



※ 1：Upon the host selection, the shape of connector might be different

※ 2：It is used for web-based monitor and configuration.

● **Please do not connect eSATA and USB2.0 or USB3.0 at the same time**

＜ Steps for eSATA connection＞

RAID（eSATA）→ PC（eSATA）

① Get the eSATA Cable inside the package connecting it between BR256 and the host.

② To use web-based monitor, connect Ethernet cable between LAN connector and host.

③ Connect AC power cable and turn on power switch at rear panel of BR256.
Turn on the host computer power and start the operation.

⚠ Warning !

Signal quality is different on SATA ports of motherboard. If you used SATA-eSATA conversion cable with BR256, it might cause issues of recognition, transmission or hot-plug. In that case, you might want to try the other SATA ports (as closed as its chipset or controller) to see if the issues were gone. To assure stability and reliability, it is recommended to use native eSATA ports or eSATA from a host bus adapter.

＜ Steps for USB2.0 or USB 3.0 connection＞

① Turn on Host computer

② Connect USB 2.0 or USB 3.0 cable tightly between BR256 and host computer

③ To use web-based monitor, connect Ethernet cable between LAN connector and host

④ Connect AC power cable and turn on power switch at rear panel of BR256.
Turn on the host computer power and start the operation.

※Do not connect both USB2.0 or USB3.0 and eSATA at the same time while file system is running

1.7 Optional parts list

● **Spare HDD Module**

Part Number	Description
BR256M0000	BR256 (Gray Module model) spare HDD module

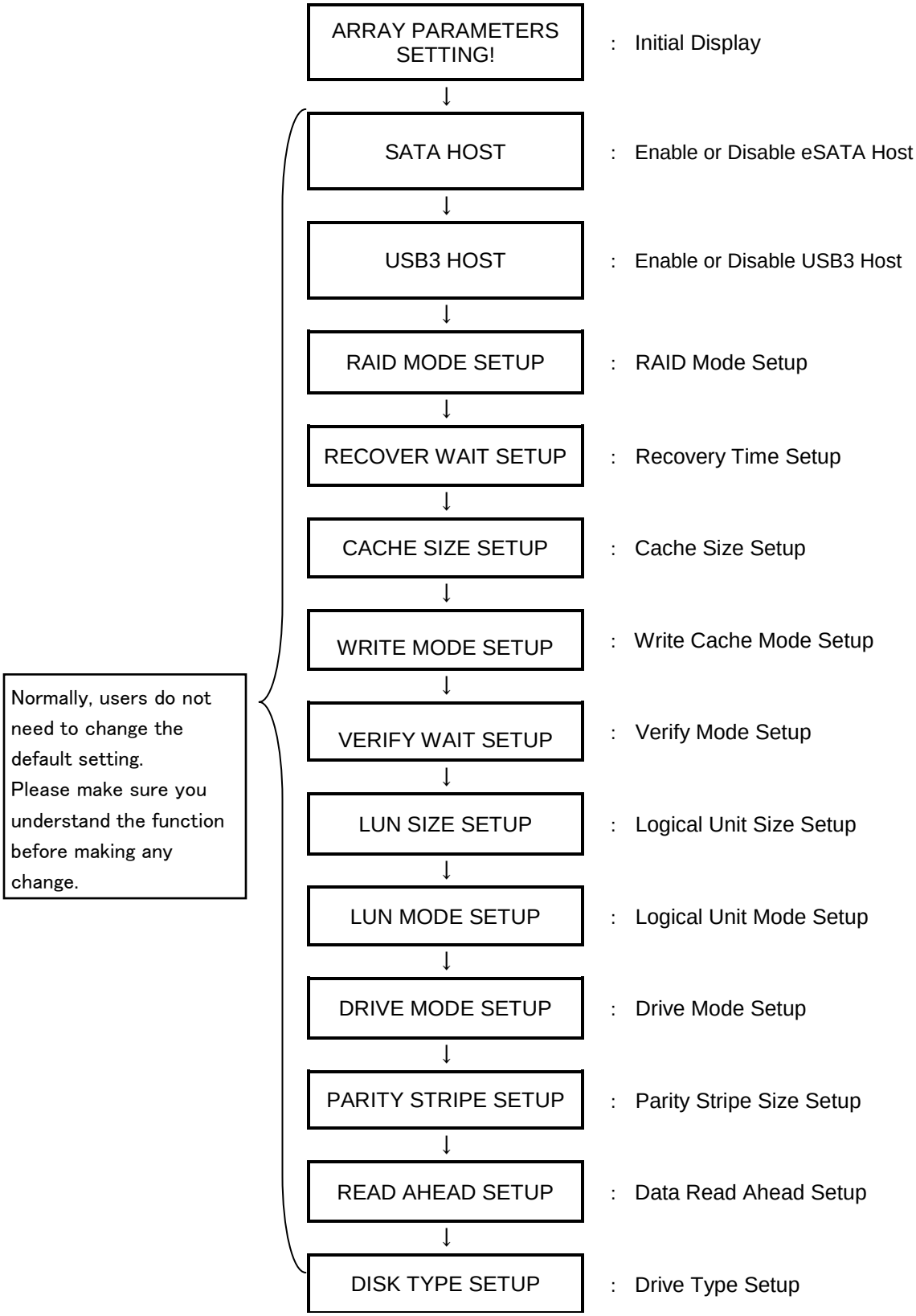
● **Send back Extension Service Pack**

Part Number	Description
BR256-SEDBK-1Y	Extra one year sendback service (Total: 2 years)
BR256-SEDBK-2Y	Extra two year sendback service (Total: 3 years)
BR256-SEDBK-3Y	Extra three year sendback service (Total: 4 years)
BR256-SEDBK-4Y	Extra four year sendback service (Total: 5 years)

※First year sendback service is included at the product purchased.

Chapter 2. Setup and Monitor

2.1 Toggle rolling setup flowchart


ARRAY PARAMETERS SETTING!
: Initial Display
SATA HOST
: Enable or Disable eSATA Host
USB3 HOST
: Enable or Disable USB3 Host
RAID MODE SETUP
: RAID Mode Setup
RECOVER WAIT SETUP
: Recovery Time Setup
CACHE SIZE SETUP
: Cache Size Setup
WRITE MODE SETUP
: Write Cache Mode Setup
VERIFY WAIT SETUP
: Verify Mode Setup
LUN SIZE SETUP
: Logical Unit Size Setup
LUN MODE SETUP
: Logical Unit Mode Setup
DRIVE MODE SETUP
: Drive Mode Setup
PARITY STRIPE SETUP
: Parity Stripe Size Setup
READ AHEAD SETUP
: Data Read Ahead Setup
DISK TYPE SETUP
: Drive Type Setup
Normally, users do not need to change the default setting.
Please make sure you understand the function before making any change.

2.2 Overview of Setup method

To simplify the procedure of setup, BR256 is designed to support all of setup options by front panel LCD. The default configuration and parameters are default for RAID-6 mode. BR256 is supposed to up and run without changing default setting unless a special configuration needed. To prevent malfunction, BR256 setting cannot be changed during operation

2.3 Setup display navigation

This section will go through the parameters setup displayed on LCD screen.

If this is first time to power on the unit, an Initialization Procedure should be done first. When powering up the BR256 unit, press and hold the Mode button (besides LCD) at power on. (**Notice: this will clean up the system status and parameters recorded in non-volatile memory.**)
（Without performing initialization, the LCD display might show「RAID-x ONE DRIVE DOWN」、「SYSTEM DOWN」 indicating the status of last time. A normal display with drives properly populated will look like

RAID-6 NORMAL

To change Parameters, BR256 needs to be powered on for Parameter Setup mode. Press the Mode and Select buttons at the same time while turning on power switch. Under Parameter Setup mode, users can also configure parameters via Ethernet connection and perform firmware upgrade.

ARRAY PARAMETERS SETTING !

MODE Button: To roll through each parameter
SELECT Button: Choose and change the parameter
Before executing Save operation, parameters won't be changed.

- ●Parameter Setup Mode ：MODE Button ＋ SELECT Button ＋ Power ON
- ●Rotate among Setup items ：MODE Button
- ●Setup parameters ：SELECT Button

To save changed parameters, pressing MODE and SELECT button once at the same time, parameters will be written to internal non-volatile memory then the change is recorded.

When you successfully change the parameter, you will see

POWER DOWN PLEASE !

Then please power cycle the system or press SELECT button for 3 seconds to take parameters effective.

If you power down before saving to memory, the settings will revert to the way they were upon the last save.

- Saving the change : ① MODE ＋ SELECT Button
  ② Power OFF or press SELECT Button 3 sec
- Cancel the change : Power off while doing change

2.4 Parameter Setup Screen and its operations

This section explains each parameter and the associated function of BR256.

PS. Please take a memo if you changed parameters different from its default value

● RAID Mode Setup

RAID MODE RAID-6

Select RAID Mode

Parameter	Function	Memo
RAID MODE RAID-6	Setup RAID 6. Please refer to Sec 1.3	Default
RAID MODE RAID-0	Please refer to Sec 1.3	
RAID MODE RAID-3	Please refer to Sec 1.3	
RAID MODE RAID-5	Please refer to Sec 1.3	
RAID MODE RAID-1	Please refer to Sec 1.3	
RAID-0 2 DRIVE MODE	Please refer to Sec 1.3	
RAID-1 3 DRIVE MODE	Please refer to Sec 1.3	
RAID MODE RAID-10	Please refer to Sec 1.3	
SINGLE DRIVE MODE	Please refer to Sec 1.3	

● Recovery Rate Setup

RECOVER RATE
5Min. /GB

Recovery operations utilize time between host data access without interrupting the current job.
Therefore data read/write can be continued without interruption.
User can choose the timing to execute recovery operations as below.

Parameter	Function	Memo
RECOVER WAIT TIME 0 Sec	Recovery request will be processed immediately between host commands. Recovery will always be processed therefore host access will be slow down. Select this mode if you want the recovery have high priority.	
RECOVER WAIT TIME 0.1 Sec	Continuous host commands will be processed first. Recovery operation will be taken care when the interval between host commands longer than 0.1 sec. The following host command has to wait till one recovery task completed except READ/WRITE or READ Cache command which will be executed immediately.	
RECOVER WAIT TIME 1 Sec	This can be used when host access are not concentrated. The wait interval following the last host command is 1 sec. On this mode, the recovery operation will not be processed if the host commands are continuous with less than 1 sec internal.	
RECOVER WAIT TIME 10 Sec	Usually this should not be used. Probably this mode can be applied if there is very little host access.	
RECOVER RATE 2Min./GB 5Min./GB 10Min./GB 20Min./GB	This is to assign a fixed recovery time for 1GB capacity despite of interval to wait between host commands. **Yet there is possibility that 5Min./GB cannot be finished in time**	Default 5Min./GB

● Cache size Setup

CACHE SIZE
128MB

To setup the cache size of BR256
Please do not alter the cache size if you did not change the cache memory

Parameter	Function	Memo
CACHE SIZE 64MB 128MB	「Cache Buffer Error」will be shown if the selected cache size not matched the installed cache memory	Default 128MB

● Write Cache Mode Setup

WRITE ALL
PENDING 0.1Sec

The controller needs more time than writing to single drive to generate parity while doing RAID-3/5/6 WRITE. Therefore Write Cache is enabled in such situation.
This parameter defines the timing to wait before starting to move cache contents into disks.

Parameter	Function	Memo
WRITE MODE WAITING	Under this setting, the Write operation will not be acknowledged as “Completed” till data is written into disks. This means no caching is used during data write. The performance is slower compared to 「WRITE MODE PENDING」mode. READ speed is not affected.	
WRITE MODE BUFFERD	Write command is acknowledged as “Completed” right after data written into cache, and cached data starts to be moved into disks at the same time.	
WRITE MODE PENDING 0.1Sec	After finishing a host command, this mode will wait 0.1 seconds and start to write data before the next command. When doing sequential writes, cache will be filled by multiple write command and data can be written once to save total write time.	
WRITE MODE PENDING 1 Sec	Similar to PENDING 0.1 sec, the wait interval is one second.	
WRITE ALL PENDING 0.1Sec 1 Sec	This mode is set as default to enable Write cache even one drive is failed.	Default

● Verify Mode Setup

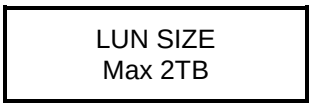
VERIFY WAIT
READ aft WRITE

Verify Mode specifies when and how to perform the data verification. You can wait until the verification to be done with [Verify Wait] mode. If you'd like to do the writes without verifying you can specify [No Verify] mode.

Also, you can choose to read the data off the disk after it has been written from cache when a read request takes place [READ aft WRITE], or you can choose not to verify it at all after the write [NO READ aft WRT]

Parameter	Function	Memo
VERIFY WAIT	The Write command cannot be completed at the time data written into cache. It has to wait till Write and Verification command completed.	Default
NO VERIFY	There is no verification operation when doing Write & Verify under such mode. A simple write will be executed. Verify command is not affected by this setting.	
READ aft WRITE	Instead of Verify command, sometimes READ command usually follows a series of Write command to compare and verify the written data. It is meaningless if cache data is used upon READ command received. This parameter is to clean up cache data after WRITE, and force data to be read from disks when READ command is received.	Default
NO READ aft WRT	This mode assumes write operation can be continued when data is into cache before moving to disk. And also it assume there is no more than one drive failed at the same time under RAID-3/5 setting. The data written into cache becomes effective immediately.	

● LUN SIZE Setup



Parameter	Function	Memo
LUN SIZE FULL	Use up all disk size as one single LUN. Depend on host operating system, LUN over 2TB size might not be recognized.	Default
LUN SIZE 16GB～256GB	LUN size is assigned to different size 16GB, 32GB, 64GB, 128GB, 256GB partitioned from LBA 0 of each disk member	
LUN SIZE MAX 2TB MAX 2TB/2 MAX 2TB/3 MAX 2TB/4	LUN size is assigned to 2TB, 2TB/2, 2TB/3 and 2TB/4 partitioned from LBA 0 of the disk member.	Default MAX 2TB
LUN SIZE 1/2 ～ 1/8 DIVISION	LUN size is equally divided as 1/2、1/3、1/4、1/5、1/6、1/7、1/8 of the whole useful disk size.	
LUN SIZE 64GB + ALL 64GB + Max2TB	Set up one LUN as 64GB and the rest of all as 2nd LUN (2nd LUN maximum is 2TB.	

※If you would like to use LUN more than 2TB, then 「LUN SIZE FULL」should be selected.

●LUN MODE Setup

LUN DIRECT
No BIAS

Parameter	Function	Memo
LUN DIRECT No BIAS	※Please refer to below explanation	Default
LUN SWAPPED No BIAS	※Please refer to below explanation	
LUN DIRECT for MBR(-1)	※Please refer to below explanation	
LUN SWAPPED for MBR(-1)	※Please refer to below explanation	
LUN DIRECT for MBR(+1)	※Please refer to below explanation	
LUN SWAPPED for MBR(+1)	※Please refer to below explanation	
LUN DIRECT for MBR(-2)	※Please refer to below explanation	
LUN SWAPPED for MBR(-2)	※Please refer to below explanation	

※LUN SWAPPED function is reserved for future dual host usage not applicable to BR256.

※Sector management of RAID are different between [NO BIAS] and [for MBR(-1) or (+1) or(-2)] Depend on host OS used, the beginning address of device might be different. And the setting might be helpful to improve the performance. The setting should not be changed during operation otherwise data will be lost. Format operation is necessary if this parameter is changed.

● Drive Mode Setup

DRIVE MODE
6

Setup number of drives in used on RAID 6

Parameter	Function	Memo
DRIVE MODE 3	3 Disks（DATA＋PARITY）Mode	
DRIVE MODE 4	4 Disks（DATA＋PARITY）Mode	
DRIVE MODE 5	5 Disks（DATA＋PARITY）Mode	
DRIVE MODE 6	6 Disks（DATA＋PARITY）Mode	Default

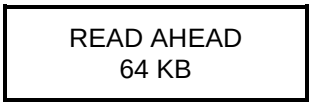
● Parity Stripe Width Setup

PARITY STRIPE 2 MB/DRIVE

Choose stripe width of RAID-5/6 LUN

Parameter	Function	Memo
PARITY STRIPE 2 MB/DRIVE 1MB/DRIVE 256KB/DRIVE 128KB/DRIVE	Setup stripe width of each drive channel. When the host issues a command, and the parity is to be written, the command is divided up into two or more operations. A relatively big stripe width is setup to reduce the overhead of continuous operation. The bigger size of stripe width, faster transfer speed can be achieved for sequential read or write. Usually 「2MB/DRIVE」 setup will give a good performance but it depends on the host application.	Default 2 MB/DRIVE

● Read Ahead Size Setup



This is to set size of data to pre-fetch into cache for read operation.

Parameter	Function	Memo
READ AHEAD 0 KB	Do not do read ahead. You might like to use this setting if read data is frequently changed across different directories	
READ AHEAD 8 KB	The read ahead size is 8KB, i.e. one page same as buffer segment size. This might be effective for general random operation.	
READ AHEAD 64 KB	This will read ahead multiple pages following the current one page. This is effective for general sequential read.	Default
READ AHEAD 256 KB	Compared to 64KB, one more page or 256KB will be pre-fetched depend on page size. This is effective for sequential access especially video data.	
READ AHEAD 1 MB	1MB or multiple page read ahead depend on page size. It will be effective if the data size is times of MBs.	
READ AHEAD 4 MB	4MB size read ahead. This might be effective if the application read directly block data without through file system.	

●Disk Type Setup

DISK TYPE xxxxB	TEST1GB, 120GB, 160GB 250GB, 400GB, 500GB, 750GB, 1TB, 2TB, 3TB, 4TB

This is to specify the size of the drive you will be using.
(Unless you plan to use different disks than the ones provided, there is no need to change this setting. The factory default is for 1GB. With HDD installed and power on first time, please change the disk type at Setup Mode）

⚠

- **Please do not change the default setting**

  If drive actual capacity was smaller than the setup disk type, an error such as「ONE DOWN L」、「SYSTEM DOWN L」might happen and buzzer will be fired.

2.5 Background Parameters

This section describes background parameters for maintenance configured before shipment.
There are two parts of these parameters, Fixed and Changeable ones.
Changeable background parameters follow with fixed parameters.

Please take a memo before you apply to change the default parameter value. Refer to Sec.2.5.2 Parameter Confirmation. Default setting is always recommended unless there is special requirement for the change.

2.5.1 Method to setup background parameters

Please make sure you understand exactly the purpose that you are changing from the default parameters.

1. Holding both the Mode and Select button, power up.

ARRAY PARAMETERS SETTING!

2. Press the SELECT button, Fixed Parameters start with Firmware version

Firm ware is Ver.x.xxx	Firmware version will be displayed

3. Press the SELECT button

Vender ID is BIOS	Vendor ID will be displayed

4. Press the SELECT button

Product ID is BR256B3-xxx6	Product ID will be displayed

5. Press the SELECT button

Serial No ID xxxxxxxx	Serial number of BR256 will be displayed

6. Press the SELECT button

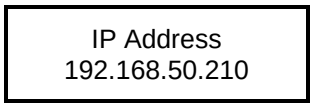
End of Fixed Parameter	Indicate the end of the fixed parameters.

After fixed parameters, if you press the Mode button now, you will enter Background Parameter mode.

Or you can directly get into Background parameters by pressing the Mode button any time during display among Firmware Version、Vendor ID、Device ID、Serial Number.

From here, pressing the Mode button to roll among changeable Background parameters.

● IP Address Setup



By pushing SELECT button, the IP Address will be increased.
The longer you hold the SELECT button, the faster the number is increased.
Push the MODE button to move to next field.

● Address Mask Setup

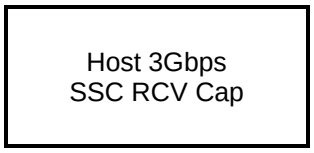
This is to setup IP address mask same as IP setup.

● Parity Mode Setup

ENABLE、DISABLE

Enable or Disable Parity

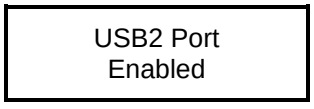
● Host Active Speed Setup



1.5Gbps SSC RCV Cap、
1.5Gbps No SSC RCV Cap、
3.0Gbps SSC RCV Cap、
3.0Gbps No SSC RCV Cap

This is to setup the maximum host speed

● USB Port Setup



ENABLE、DISABLE

Enable or Disable USB2 port connectivity

● Maximum Drive Sequential Transmission Speed SSC Setup

Disk 1.5Gbps No SSC Rcv Cap	1.5Gbps SSC RCV Cap、 1.5Gbps No SSC RCV Cap、 3.0Gbps SSC RCV Cap、 3.0Gbps No SSC RCV Cap

The setup is to setup maximum drive speed and SSC(Spectrum Scatter Clock). Depend on hard disk; SSC might affect the stability of data access. Please check your hard disk specification and adjust if necessary.

● Flush cache command setup

Ignore FLUSH CACHE	Enable / Ignore

Enable or Ignore「FLUSH CACHE」command function. Default is “Ignore”

【 **Ignore** 】RAID cache data will not be written to disk from cache when Flush Cache was received. This will improve the file access performance and is recommended. Usually RAID cache size is bigger than hard disk cache so writing data from RAID cache to disk will spend longer time.

【 **Enable** 】When File Close is executed, the Flush Cache command will be followed to have Cache data written into HDD. HDD will also synchronize cache till Write operation finished.

● Background Write Setup

WRITE BACK MAX SIZE 4MB/CH	64KB / 128KB / 256KB / 512KB / 1MB / 2MB /4MB

Setup the maximum size of data stored in cache for Sequential Write

When data size written to cache is bigger than the setup size, data will be partitioned to parts for writing.

● Write Retry Mode Setup

WRITE RETRY MODE	NO WRITE RETRY MODE/ WRITE RETRY MODE

Enable or disable RETRY; controller will retry the operation when an error is detected during RAID-3/5/6 Write operation. If NO WRITE RETRY MODE is set, an error will immediately move the controller status to 「ONE DOWN」

● Buffer Segment Size Setup

BUFFER SEGMENT SIZE 64KB/CH	8KB/CH,16KB/CH,32KB/CH,64KB/CH

Setup buffer segment size per drive channel. This is the size of data block for one command. For large sequential data access, the bigger size can give better performance. On the contrast, for random access, the smaller size can give better performance.

● Wait Time of Retry Setup

RETRY MAXIMUM TIME 5S	25S/10S/5S/1S/0.1S

Setup the interval between drive time out and retry.（「1S」,「0.1S」is only for testing）
The actual processing time will take 2 or 3 times of the setting. OS might need to setup a longer time out interval because of the longer retry processing on storage system.

● Sequential List Size Setup

SEQUENTIAL LIST SIZE 8	8/16/32/64

This is to setup a table size of judging the access pattern as Sequential or Random. It depends on also simultaneous number of streams and size of cache memory.

● Sequential Read Ahead Multiplier Setup

SEQUENTIAL READ AHEAD 8 TIMES	2 TIMES/4 TIMES/8 TIMES/16 TIMES/32 TIMES

Either use a fixed size or this multiplier times access size as the data size of sequential read ahead. Larger size will be chosen. Cache memory will be quickly consumed if the large size is setup. Usually, the size should be set up small when host power is low or vice versa.

● Cache Management Setup

DPO/FUA BIT DISABLE	ENABLE/DISABLE

This is to Enable or Disable the cache control flag of SCSI standard.

DPO(Disable Page Out) ：Depend on the execution of command, DPO allows to discard the data in the cache by other commands.

FUA(Force Unit Access) ：During command execution, it forces the drive access.

For details, please refer to SCSI-2 standard.

● Slow Drive Detection Time Setup

CHECK DRV DELAY TIME 1S	NONE/0.1S/0.5S/1S/5S

This setting decides how long to wait for detection of slow drive after first drive initialization completion.「0.1S」,「0.5S」are for testing.

This function does not work when the parameter is set to「NONE」or status under「ONE DOWN」or「SYSTEM DOWN」.

If there is a certain process, and it causes data retries within a certain disk or media, or the time needed to write to another drive taking long, then entire performance is slow down.（Transfer speed will suffer.）

In this sense, it is an early indication to warn for replacing slow drives.

The slow disk channel warning will be displayed on the LCD. Refer to Sec. 4.9.3 MOST DELAY CH.

● Power On Standby Time Setup

WAIT POWER ON TIME 10S	1S/5S/10S/15S/20S

Sometimes drives are not accessible after getting power connected. For this period specified, the RAID controller will respond to host as drives not accessible. (For example, “Not Ready” is responded to “Test Unit Ready” command.)

● Drive Ready Wait Time Setup

HDD WAIT READY TIME 1 MIN	1 MIN/3 MIN/5 MIN

Set up time to wait for Drive getting Ready.

Usually the drive is judged as DOWN if it is not ready after certain period after power on but some high speed and high capacity drive will need a longer period WAIT time to get ready.

● Cache Memory Check Timing Setup

CHECK CACHE NORMAL	NORMAL/FAST/NO

This setting specifies the speed of the background cache memory check to take place after the system powers up. If the cache memory onboard is large the check will take some time so if you wish to speed up the process please set this to “FAST”. Set to “NO”, then no check will take place. For quick performance measurements, set this parameter to NO. The actual cache during operation will not be affected by this setting.

● HDD Patrol Mode Setup

AUTO HDD PATROL	NO/AUTO

Normally the surface scan of HDD will be executed in background.(not applicable for RAID-0)

NO : No Auto Patrol
AUTO : Auto Patrol On
The surface scan will start from LBA 0 of the disk between host commands.

If there is any failure on read sector, the recovery sector generated by other disks will be written to the disk for recovery.(Rewrite Function)

PATROL Mode can be changed during operation.

● Patrol Time Setup

SYSTEM PATROL 30 DAYS/CYCLE	10S, 5S, 3S, 5 DAYS/CYCLE, 10 DAYS/CYCLE, 20 DAYS/CYCLE, 30 DAYS/CYCLE

This parameter is to specify the period of doing patrol. You can setup 「10S」,「5S」,「3S」to perform one time patrol or you can setup「5 DAYS/CYCLE」,「10 DAYS/CYCLE」,「20 DAYS/CYCLE」,「30 DAYS/CYCLE」to perform whole capacity patrol.
The length of one Patrol depends on this setting and the Buffer Segment Size.

Then push MODE button for moving to foreground parameters.

2.5.2 Parameter Confirmation

Sometimes you will need to read and confirm the setup of current parameters then you can press both MODE and SELECT button on the front at the same time for this. Firmware version will be shown at the beginning and the content can be changed by pressing MODE button.

< Factory Default Setting >

This is a convenient form for customer to record all parameters.

Parameter	Default	Notes
Firmware	Firm ware is Ver. x.xxx	Firmware Version
Vendor ID	Vender ID is BIOS	
Model No	Product ID is BR256B3-xxx6	Vary as different model
Serial No	Serial No ID xxxxxxxx	Product serial number
SATA HOST	**Enable**	Enable or disable eSATA
USB3 HOST	**Enable**	Enable or disable USB3
Raid Mode	RAID MODE **RAID-6**	SINGLE DRIVE / RAID-1 / RAID-0 2 / RAID-1 3 / RAID-10 / RAID-6 / RAID-0 / RAID-3 / RAID-5
Drive Mode	DRIVE MODE **6**	3 / 4 / 5 / 6
eSATA Speed	Host 3.0Gbps **SSC RCV Cap**	1.5Gbps SSC RCV Cap, 1.5Gbps No SSC RCV Cap, 3.0Gbps SSC RCV Cap, 3.0Gbps No SSC RCV Cap
USB2 Port	**Enabled**	Enabled or Disabled
FLUSH CACHE	**Ignore** FLUSH CACHE	Ignore or Enable
Max Disk Sync	Disk 1.5Gbps **No SSC Rcv Cap**	1.5Gbps SSC RCV Cap, 1.5Gbps No SSC RCV Cap, 3.0Gbps SSC RCV Cap, 3.0Gbps No SSC RCV Cap
Disk Type	DISK TYPE **xxxB**	TEST1GB, 120GB, 160GB, 250GB, 400GB, 500GB, 750GB, 1TB, 2TB, 3TB, 4TB
LUN MODE	LUN **DIRECT No BIAS**	DIRECT No BIAS / SWAPPED No BIAS / DIRECT for MBR(-1) / SWAPPED for MBR(-1) / DIRECT for MBR(+1) / SWAPPED for MBR(+1) / DIRECT for MBR(-2) / SWAPPED for MBR(-2)
Cache Size	CACHE SIZE **128 MB**	64 MB / 128MB
LUN Size	LUN SIZE **Max 2TB**	FULL / 16GB / 32GB / 64GB / 128GB / 256GB / 1/2 /1/3 /1/4 / 1/5 / 1/6 / 1/7 / 1/8 / 64GB+ALL / 64GB+MAX2TB /Max 2TB, Max 2TB/2, Max 2TB/3, Max 2TB/4
Parity Stripe	PARITY STRIPE **2 MB**/DRIVE	2 MB / 1 MB / 256 KB / 128 KB
Read Ahead	READ AHEAD **64 KB**	0 KB / 8 KB / 64 KB / 256 KB / 1 MB / 4 MB
Recover RATE	RECOVER **RATE 5Min./GB**	TIME 0Sec / TIME 0.1Sec / TIME 1Sec / TIME 10Sec/ 2Min./GB / 5Min./GB / 10Min./GB / 20Min./GB
Write Mode	WRITE **ALL PENDING 0.1Sec**	WAITING / BUFFERD / PENDING 0.1Sec / 1 Sec / ALL PENDING 0.1Sec / 1Sec
Retry Time	RETRY MAXIMUM TIME **5S**	25S / 10S / 5S / 1S / 0.3S
DPO/FUA	DPO/FUA BIT **DISABLE**	ENABLE / DISABLE
Check Delay	CHECK DRV DELAY TIME **1S**	NONE / 0.1S / 0.5S / 1S / 5S
Power On Wait	WAIT POWER ON TIME **10S**	1S / 5S / 10S / 15S / 20S
Wait Ready	HDD WAIT READY TIME **1 MIN**	1 MIN / 3 MIN / 5 MIN
Sequential Ahead	SEQUENTIAL READ AHEAD **8 TIMES**	8 TIMES / 16 TIMES / 32 TIMES / 2 TIMES / 4 TIMES
Check Cache	CHECK CACHE **NORMAL**	NORMAL / FAST / NO
Auto Patrol	**AUTO** HDD PATROL	AUTO / NO
Patrol Wait Time	SYSTEM PATROL **30 DAYS/CYCLE**	WAIT 10S / 5S / 3S / 5 / 10 / 20 / 30 DAYS/CYCLE
Write Retry	**WRITE RETRY MODE**	NO WRITE RETRY / WRITE RETRY
Back Write Size	WRITE BACK MAX SIZE **4MB/CH**	64KB / 128KB / 256KB / 512KB / 1MB / 2MB / 4MB
Parity	**ENABLE** PARITY	ENABLE / DISABALE
Buffer Segment	BUFFER SEGMENT SIZE **64KB/CH**	8KB/CH / 16KB/CH / 32KB/CH / 64KB/CH
Sequential List	SEQUENTIAL LIST SIZE **8**	8 / 16 / 32 / 64

Verify Wait	**VERIFY WAIT READ aft WRITE**	VERIFY WAIT READ aft WRITE / VERIFY WAIT NO READ aft WRT / NO VERIFY READ aft WRITE / NO VERIFY NO READ aft WRITE

Quick Overview of From Panel Button Operation

BR256 button operations can be summarized as below

Item		Operation
Force Reset		MODE + Power ON
Mute Buzzer		MODE
Parameter Setup	Start	MODE + SELECT + Power ON
	Roll next item	After parameter setup MODE
	Change the setting	After parameter setup SELECT
	Write the setting	After parameter setup MODE + SELECT
	Cancel the change	Power Off during the parameter change
Status Information	Browse Parameters	During operation MODE + SELECT Press MODE to roll to next parameters
	Check Error Status	During operation SELECT MODE + SELECT escape
	Cancel RETRY display	During operation, press MODE + SELECT twice
	Performance information	Under Browsing Parameters, press SELECT Use MODE to check each drive
	Cache Memory Confirmation	Press MODE after Performance Information
	Slow Drive Confirmation	Press MODE after Cache Memory Confirmation
	PATROL Mode Change （Auto、Force、No）	Press MODE after host performance confirmation SELECT : switch among settings MODE + SELECT to set the change
	Address Confirmation MAC Address → IP Address → Address Mask → Gate Way Address	Press MODE after PATROL Mode Change MODE to check each address

2.6 Web-based Monitor and Setup via Ethernet

To monitor BR256 via Web management GUI, you can connect Ethernet cable to a host computer.

2.6.1 Web Connection

To use Web management, Ethernet parameter must be configured correctly before launching a Web browser (such as Internet Explorer). For IP Address configuration, please follow steps below.

- **Parameter Setup Mode**

  First press MODE and SELECT button at power on BR256. The system will enter Parameter Setup mode as shown on LCD display.

  ARRAY PARAMETERS
  SETTING

- **IP Address Setup**

  Press SELECT then MODE; it will enter IP address setup parameter.
  Use SELECT button to change the number and MODE to switch to next field.
  Hold SELECT button then number will rise faster.

  IP Address
  192.168. 50.210

  After setting up, press MODE and SELECT at the same to save the change

  POWER DOWN
  PLEASE!

  Before the Save operations, the IP address will not be changed.

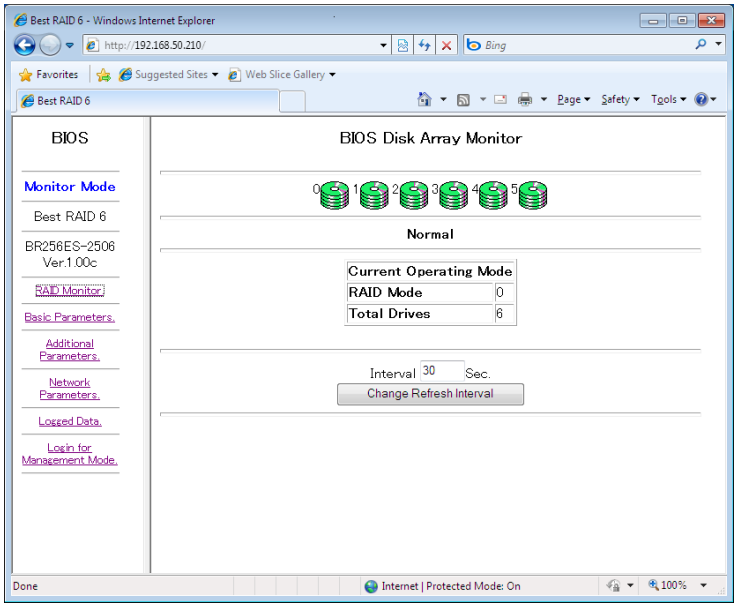
  The new IP address will be effective after system reboot.

- **Default IP address**

  The default IP address of the product is 192.168.50.210

2.6.2 Main Menu

With power on and Ethernet connected, launch the Internet browser with preset IP address.「http://<IP Address>」. The Web main menu will be displayed as below for Monitor Mode.



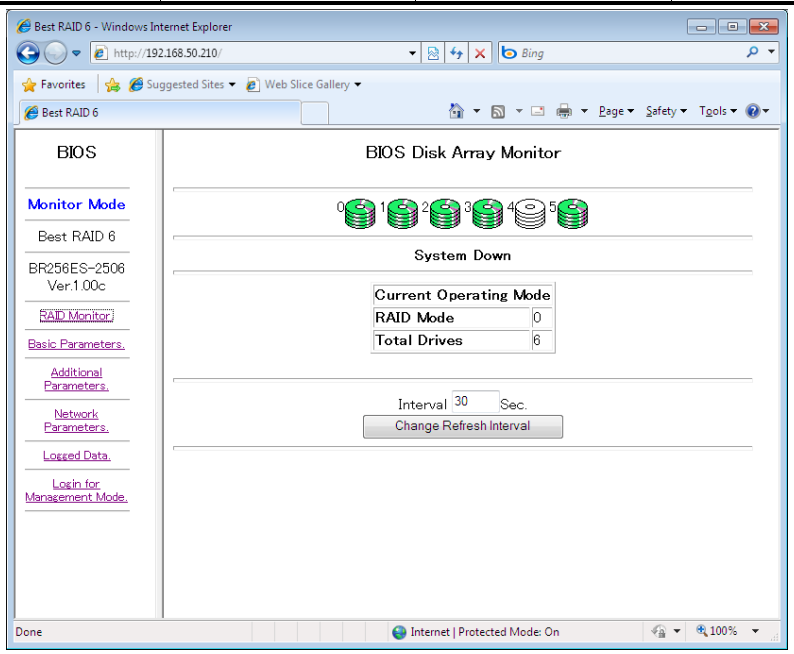
2.6.3 Monitor Mode

Disk Array Monitor:

Click on [RAID Monitor] from left main menu to enter the status monitor page. The refreshing interval can be changed by specifying the requested time and apply Change Refresh Interval.

Drive status can be differentiated by color.

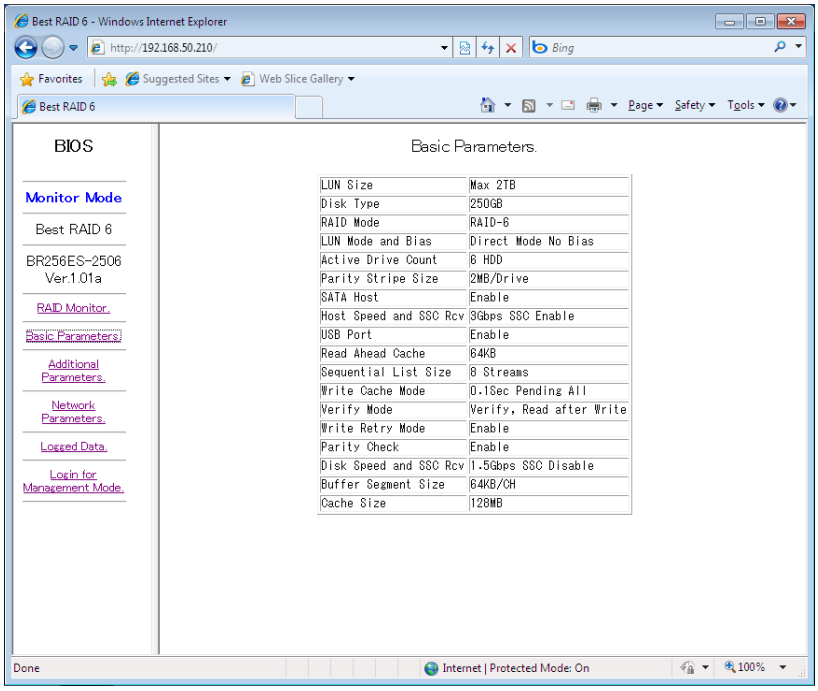
Green	Red	Yellow	White
Normal	One Down Two Down System Down	Recovering Verifying	Not installed



RAID parameters cannot be changed but shown under Monitor mode

<Basic Parameters>

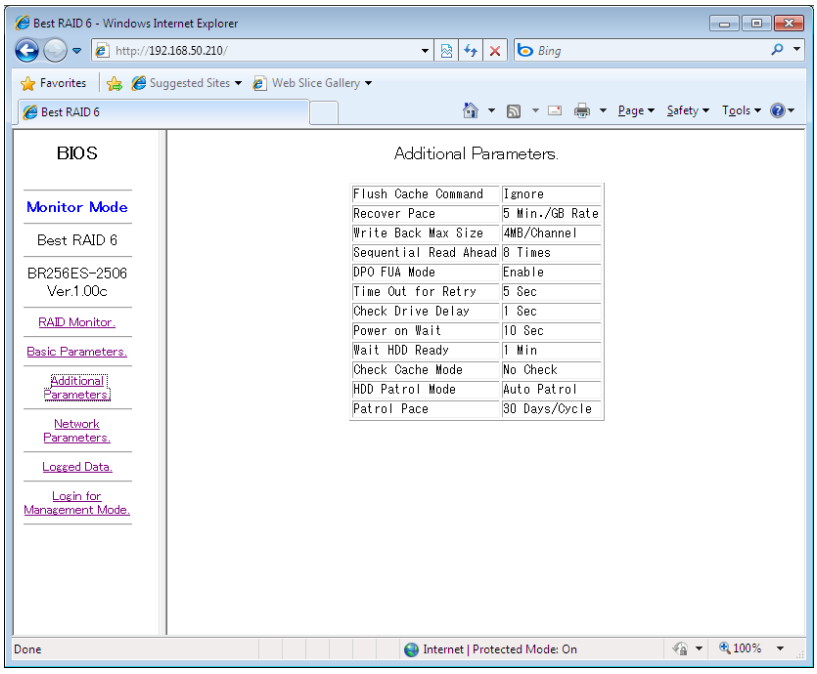
Click on menu [Basic Parameters] to show basic RAID parameters.



＜Basic parameter screen＞

＜Additional Parameters ＞

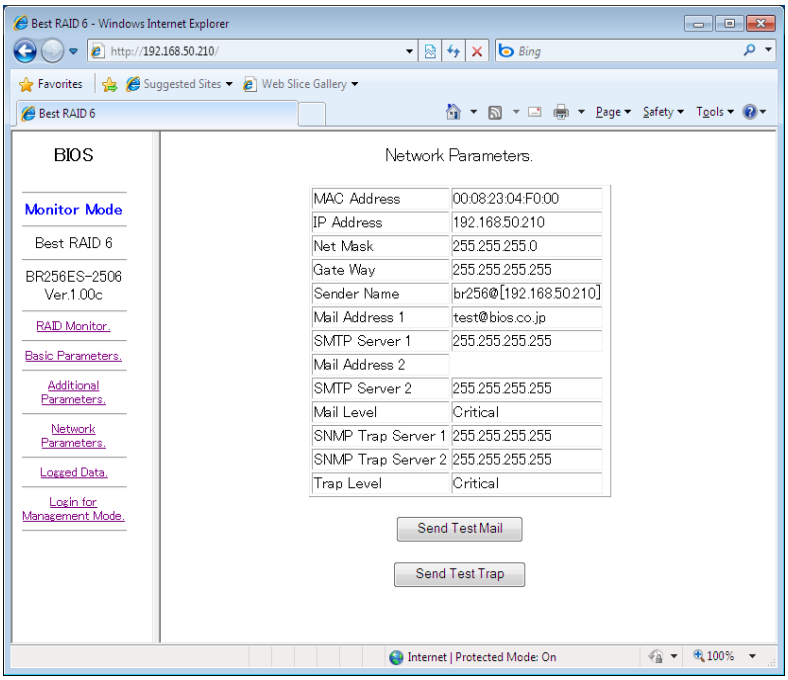
Click on menu [Additional Parameters] to show additional RAID parameters.



＜Additional RAID parameters＞

＜Network Parameters＞

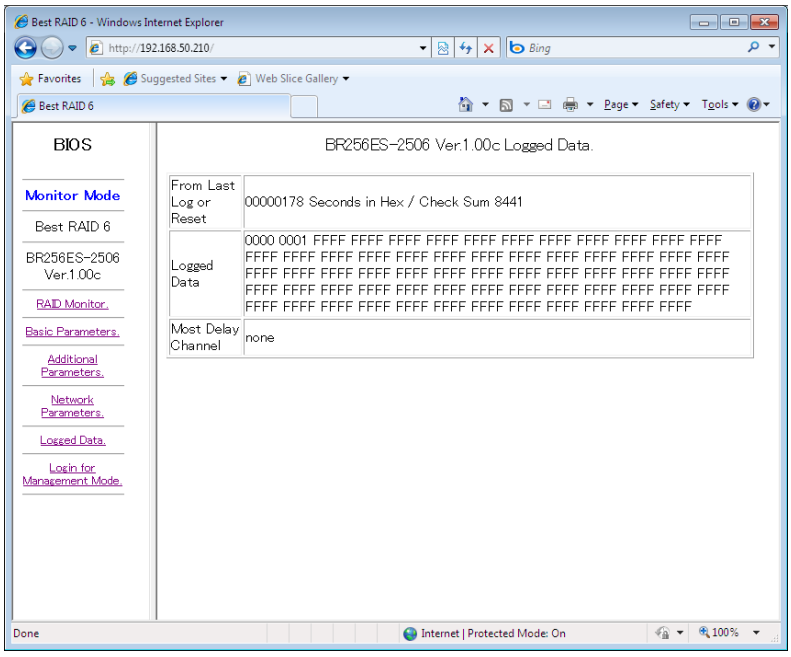
Click on menu [Network Parameters] to show Network related parameters.



＜Network related parameters screen＞

＜Logged Data＞

Click on menu [Logged Data] to show Logged Data.



＜Logged data screen＞

Logged data shows the historic events after power on.

First item on top of the log table shows either the lapsed time of last log or the lapsed time after power on. Time is shown in Second by hexadecimal. The checksum value on its right hand side is only for firmware identification. It varies per firmware version.

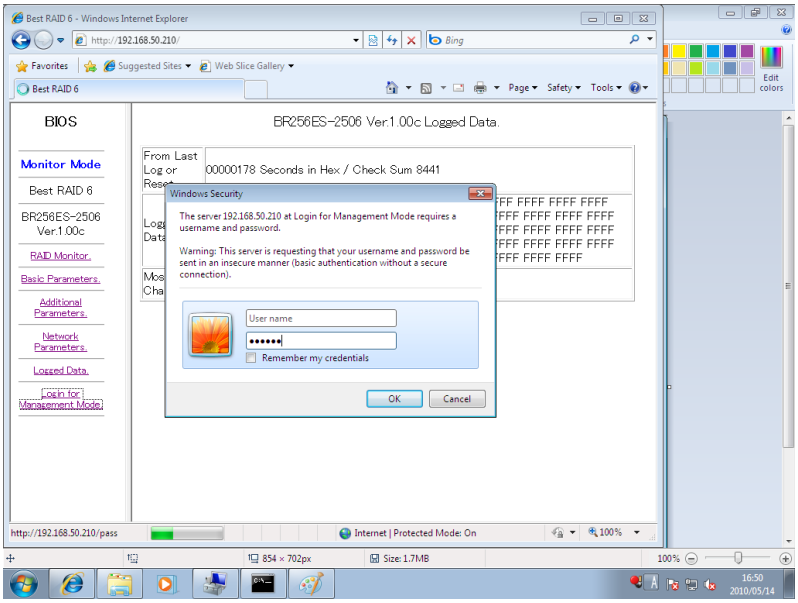
The next number indicates the sequence of Log. The last log is right before number FFFF.

The number 0020～0022 has special meaning for email notification error. See below explanation.

2.6.4 Management Mode

To modify additional parameters of RAID control or SMPT email setup, you need to login to secured management mode.

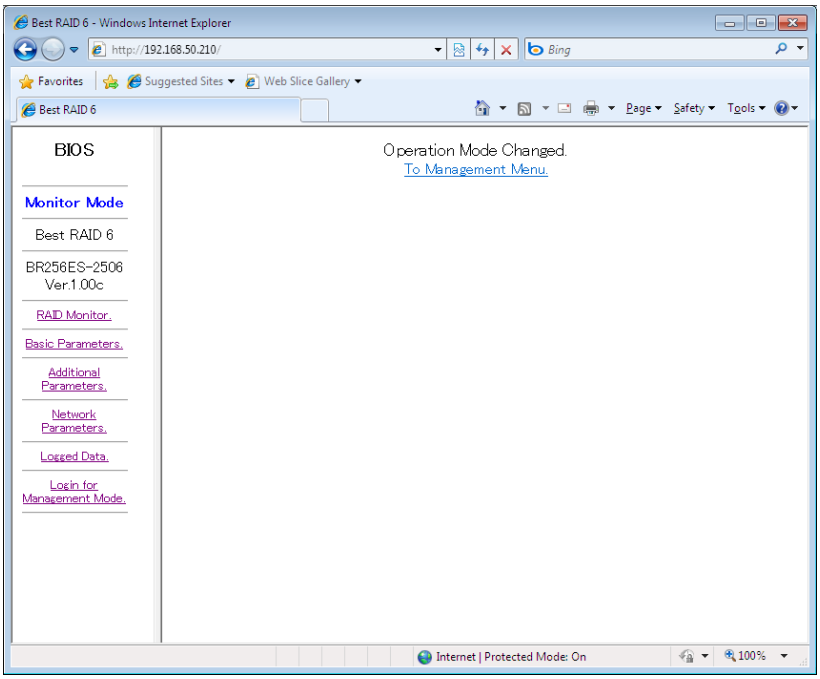
Click [Login for Management Mode] from main menu.


Best RAID 6 - Windows Internet Explorer
BIOS
Monitor Mode
Best RAID 6
BR256ES-2506 Ver.1.00c
RAID Monitor.
Basic Parameters.
Additional Parameters.
Network Parameters.
Logged Data.
Login for Management Mode.
BR256ES-2506 Ver.1.00c Logged Data.
00000178 Seconds in Hex / Check Sum 8441
Windows Security
The server 192.168.50.210 at Login for Management Mode requires a username and password.
Warning: This server is requesting that your username and password be sent in an insecure manner (basic authentication without a secure connection).
User name
Remember my credentials
OK
Cancel

＜Pop window for User Name/Password to enter Management mode＞

Default password is”passwd” and leave user name as empty

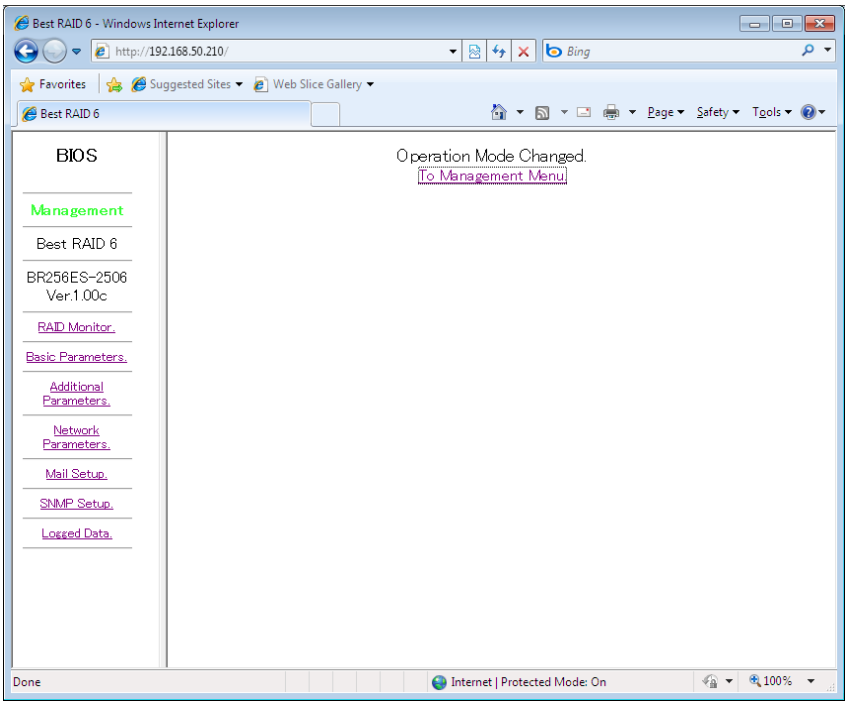
- To change password, refer to **2.7 Setup** ＜Change Password＞



＜Page shown for changing to Management mode＞

Switch to Management Mode buy clicking on [To Management Menu] when Operation Mode Changed is pop

up.



＜Page indicates Management mode＞

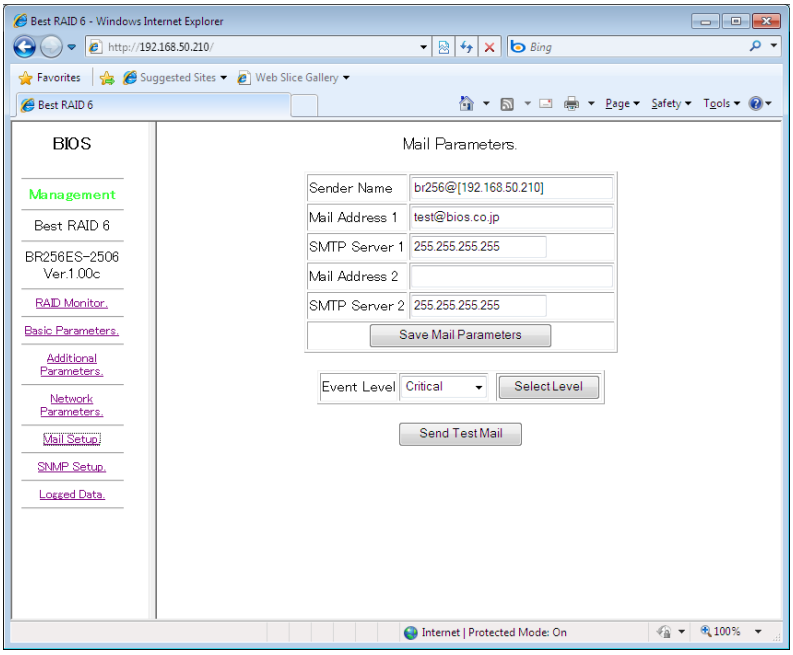
You can then modify additional RAID parameters, email and SMTP setting.

2.6.5 Setup of email notification

＜Mail Setup＞ Mail Setup

It allows you to change email sending parameters and send a test email.
It is necessary to login to Management Mode or Setup Mode before you can make the change.

Click on [Mail Setup] from the main menu.



＜Page for setup mail parameters＞

- **Sender Address BR256@192.168.50.210**

  Up to 63byte alphabet, number, “_”, “-“, “@”, and “.” is allowed. Two byte characters such as Chinese are not allowed.

- **Receiver Address test@bios.co.jp**

  Up to two receivers address are allowed.
  For users who want to have more than 2 receivers, you need to setup alias on assigned email server.
  Allowable characters are same as Sender address.

- **SMTP Server Address255.255.255.255**

  Setup IP Address of SMTP server.
  IP of 255.255.255.255 will prohibit emails to be sent out.

  1）Directly setup the IP to SMTP server

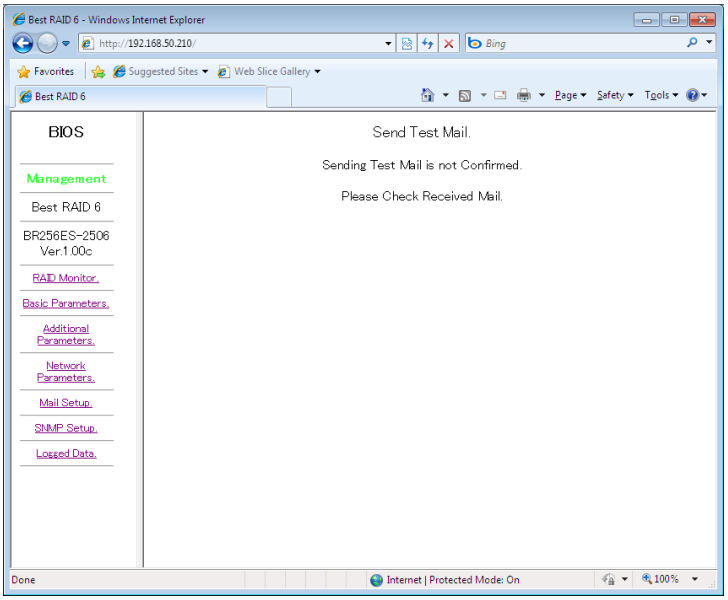
  This is most effective way to issue email alert. However Gateway address might be necessary if SMPT server is not within the same LAN. (see Basic Parameter, Setup page) At the same time, this will expose the BR256 accessible from outside of LAN. This might cause the security issue.

  2）Assign local SMTP Server

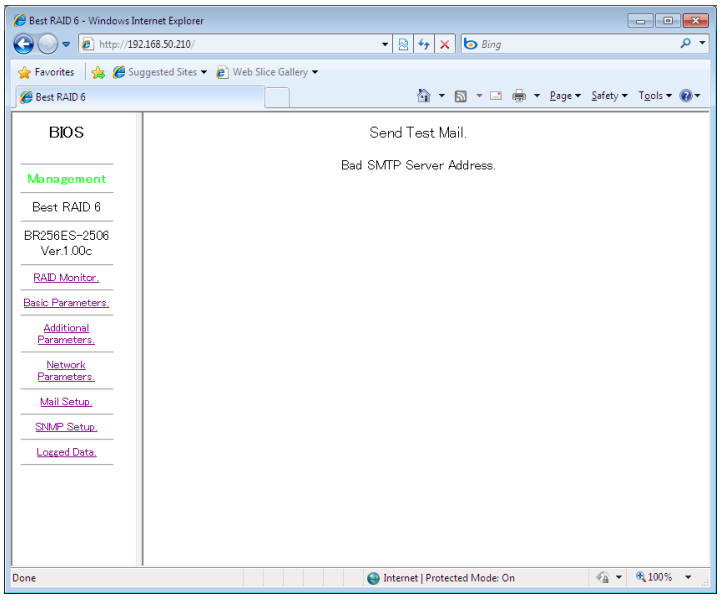
  If there is no need for authentication, you can forward (relay) from BR256 by setting up the local SMPT server. For Windows OS, you can setup IP address of BR256 on SMPT which has the RELAY function.

- **Send Test Mail （button）**

By clicking on “Send Test Main” button following the email setup, you can send a test email to the receiver address for confirmation. To send a test email, you have to login to Management mode, but no need to be in Setup Mode.



＜A successful screen＞



＜A failed screen＞

There will be “Sending Test Mail” shown on the screen indicating the email in transmission. And the log will record a message if the test mail was sent out. Possible error code if the Send Test Main failed after retried.

0020: SMTP was not found
0021: Gateway was not found
0022: SMTP did not respond

It might take up to 10 mins for the retrial if the mail could not be sent.
There might be cases which SMTP did respond but with wrong answer. We suggest trying a different SMTP server under such situation.

2.6.6 Mail Format

The mail format will be looked like below:

From: BR256@[192.168.50.210]
To: test@bios.co.jp
Subject: Alert from BR256

Alert Condition of BIOS BR256xx-xxx6 Ver.x.xxx
Serial Number= xxxxxxxx
Alert Reason = Test of Send Mail.

１） From: Mail sender, this machine
２）To: Receiver
３）Subject:
４）Alert Condition of vendor name, device name, and version.
５）Serial Number: the serial number of this device
６）Alert Reason: Cause of this email sent

2.6.7 Conditions of Mail Notification

Under below conditions, the mail will be sent:

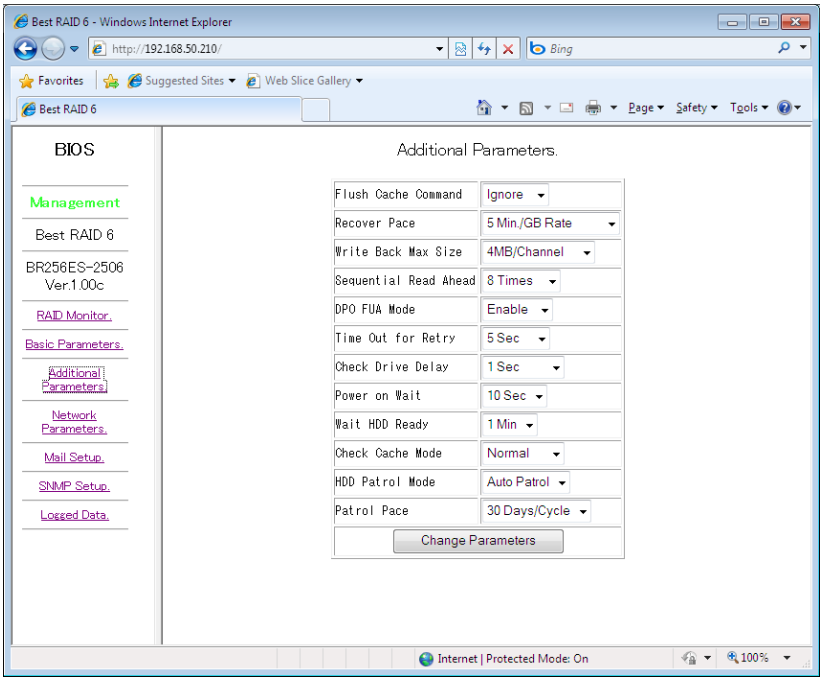
１）Drive failure	One Drive Down
	Two Drives Down
	System Down
２）Completion of Drive Recovery	Recover Finished
３）System Power Off	Power Unit Down
４）Fan is failed	Fan Unit Down

If the event was remained, the same email will be sent again upon the power recycling. If there are more than two events happened at the same time, only the first one will be sent.

2.7 Setup

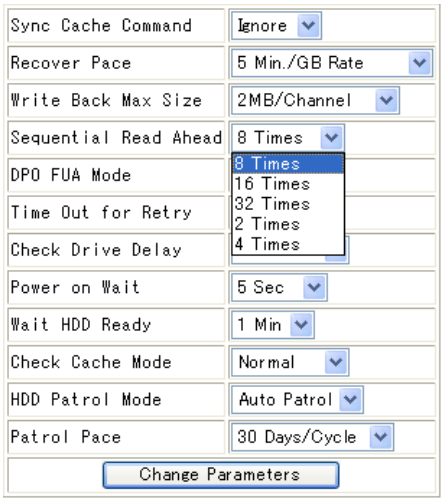
< Additional Parameters >

In Management Mode, click Additional Parameters under main menu to enter Additional Parameters Page



＜Additional Parameters Page＞

Parameter settings under additional parameters can be changed without effecting data on the RAID system.



Scroll to the parameter value you wish to change then click Change Parameters button to save the change.

● Setup Mode

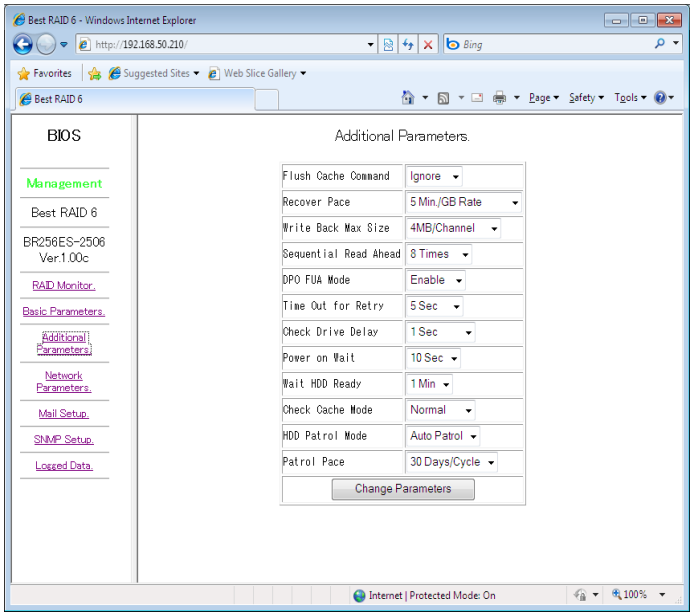
First, Power on the RAID system while holding both MODE and SELECT buttons to enter Setup Mode.

(LCD Display: ARRAY PARAMETERS SETTING)

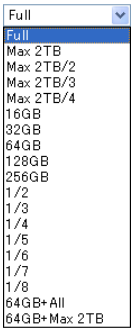
Launch the web browser with preset IP Address to connect to the management GUI. The default IP address is 192.168.50.210

＜Critical Parameters＞

Click on Critical Parameters under main menu to enter Critical Parameters page.



＜Critical Parameters Page＞



＜Parameter Example: LUN Size＞

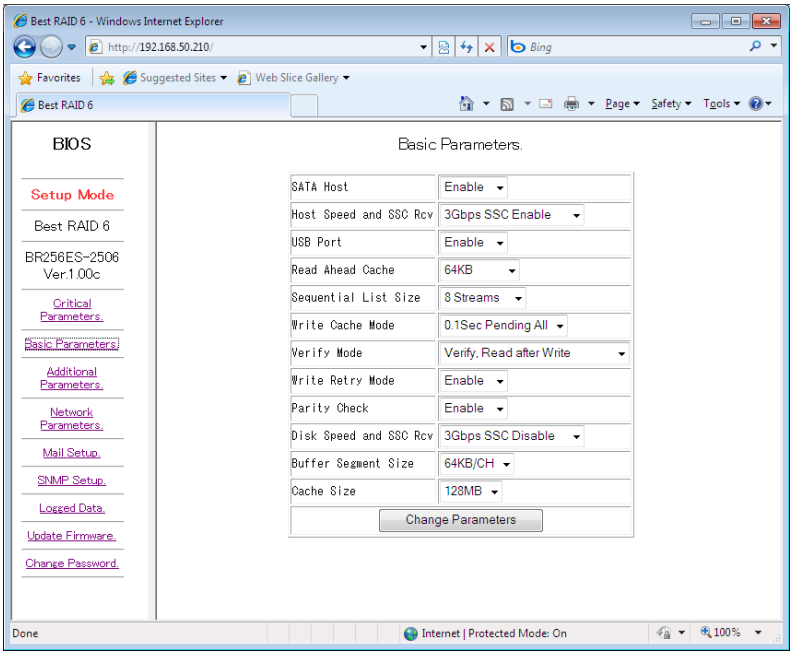
Scroll to the parameter that is needed to changed and click Change Parameters button to save it. Then, re-boot the RAID system so changes will be reflected.

Warnings

Change of any critical parameters will result whole data loss. After change, it is required to re-create new partition and formatting process.

＜Basic Parameters＞

Click on Basic Parameters under left panel to enter Basic Parameters page.

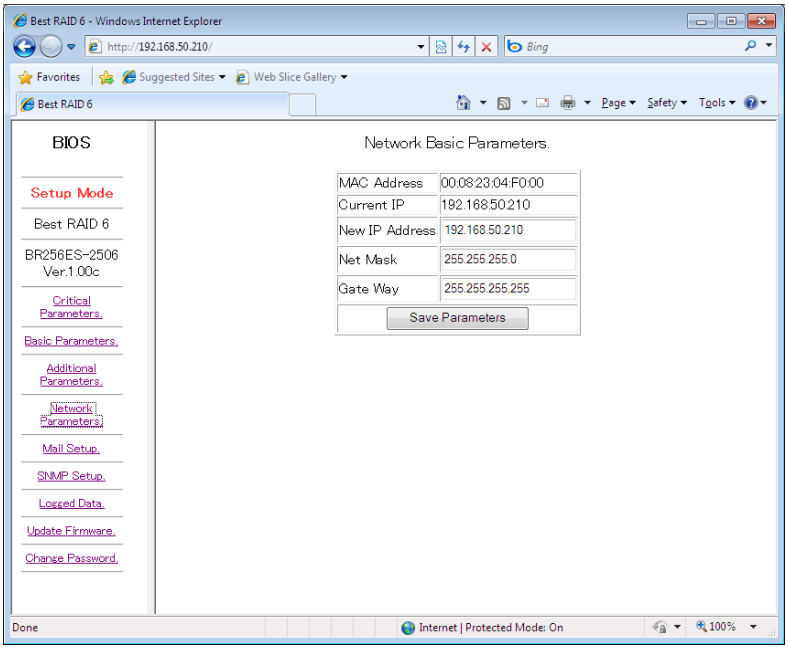


＜Basic Parameters Page＞

Scroll to the parameter that is needed to changed and click Change Parameters button to save it. Then, re-boot the RAID system so changes to reflected.

<Network Parameters>

Click on Network Parameters under left panel to enter Network Parameters page.

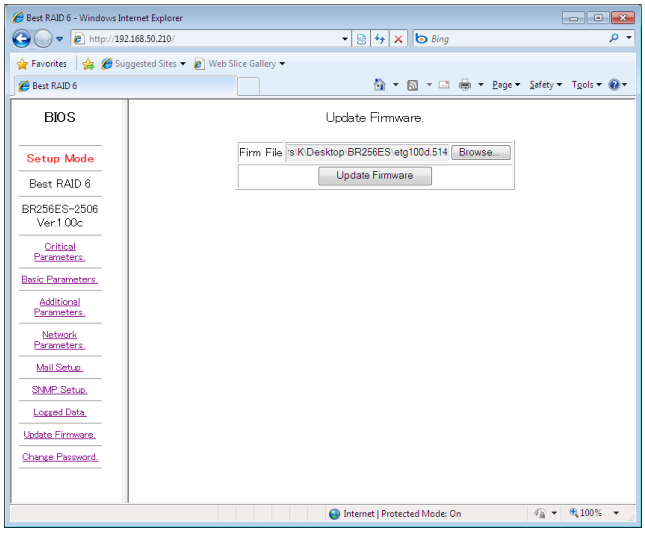


＜Network Parameters Page＞

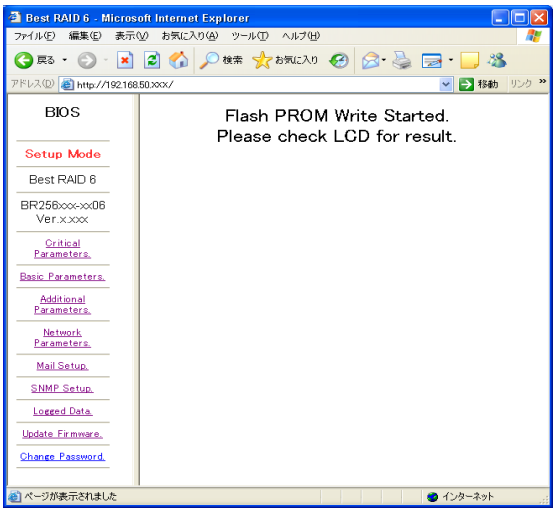
After entering correct network information, click Save Parameters button to save it. Then, re-boot the RAID system so changes to reflected.

<Update Firmware>

Click on Update Firmware under left panel to enter Update Firmware page.



Navigate through file system to locate firmware file and click update firmware button to start update process.



Once update process has started, front LCD display will change to following message.

＜BR256　LCD Display＞

Please Wait ! Firm Updating

Firmware is being updated

Power off Now ! Firm Update OK

Update complete Please Reboot the system.

If the process failed the following screen will be shown.

＜Wrong firmware file or transmission error＞

＜BR256　LCD Display＞

Error Retry Now !
Don't Power off

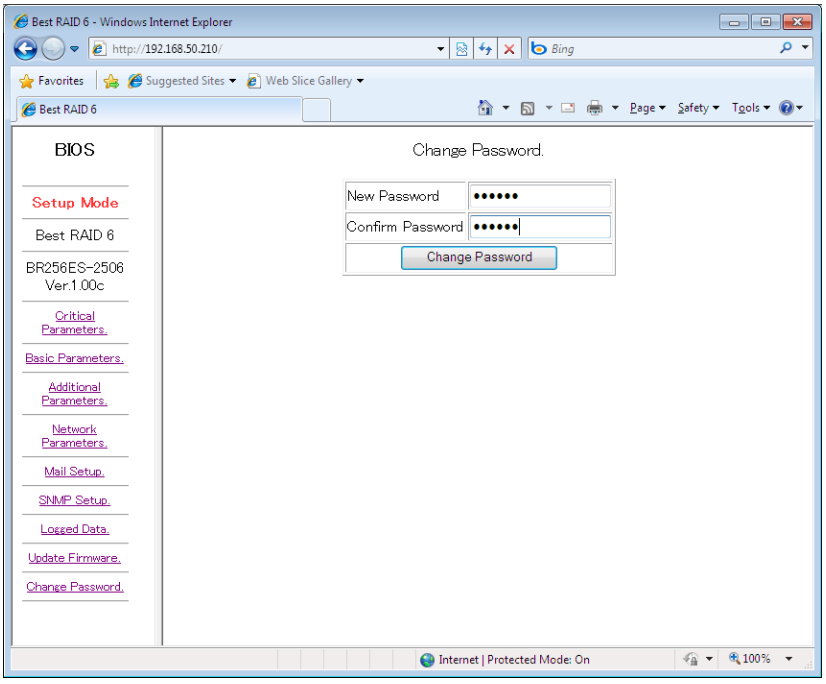
Error has occurred during the process.

Warning!!

Do not turn off RAID system at this point. Instead, retry without rebooting the system. If the process still failed, please contact support people.

<Change Password>

In Setup Mode, click Change Password under main menu to enter Change Password page. This allows you to change the password for logging into "Management Mode".



＜Change Password Page＞

1）Enter new password in New Password and Confirm Password box. (Max 6 digits)

2）Click Change Password button to save the change

Reboot the RAID system for change to take effect.

What if I forgot my password?

Old password is not needed to change the password itself, so just change to new password.

● **Available functions for each Mode with WEB GUI**

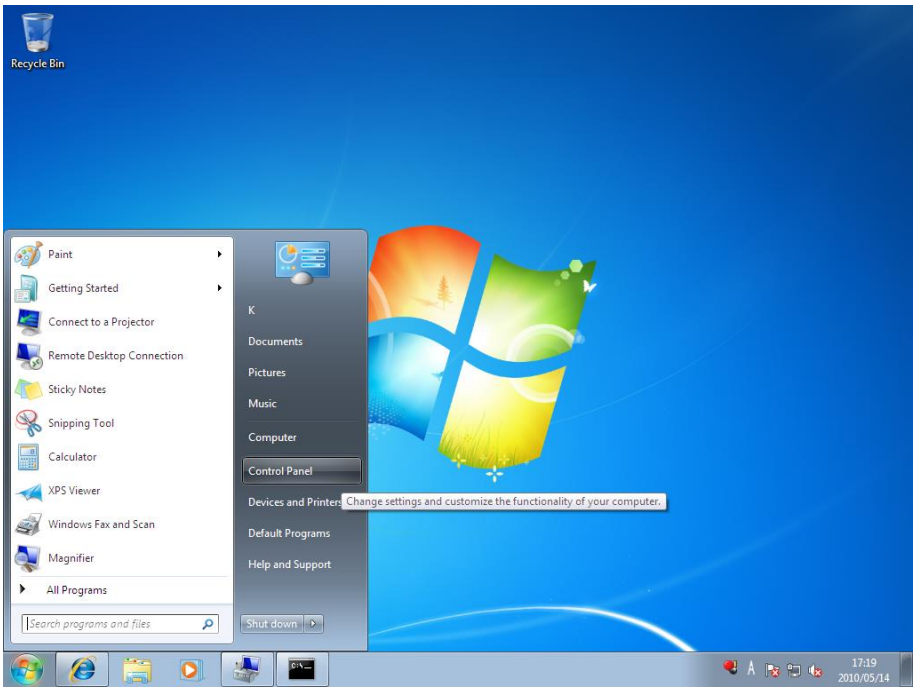
Menu	Monitor Mode		Management Mode		Setup Mode	
	Read	Modify	Read	Modify	Read	Modify
RAID Monitor	O	X	O	X	X	X
Basic Parameters	O	X	O	X	O	O
Additional Parameters	O	X	O	O	O	O
Critical Parameters	X	X	X	X	O	O
Network Parameters	O	X	O	X	O	O
Mail Setup	X	X	O	O	O	O
SNMP Setup	X	X	O	O	O	O
Logged Data	O	X	O	X	O	X
Update Firmware	X	X	X	X	O	O
Login for Management Mode	O	O	X	X	X	X
Change Password	X	X	X	X	O	O

Read：You can see the items

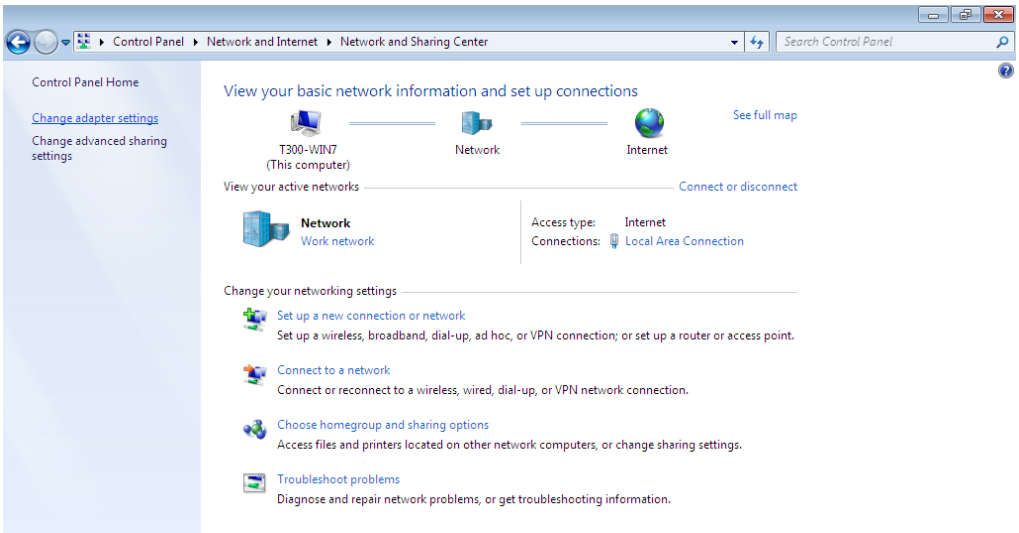
Modify：You can modify the parameters or executes the operation.

2.8 Host LAN Configuration

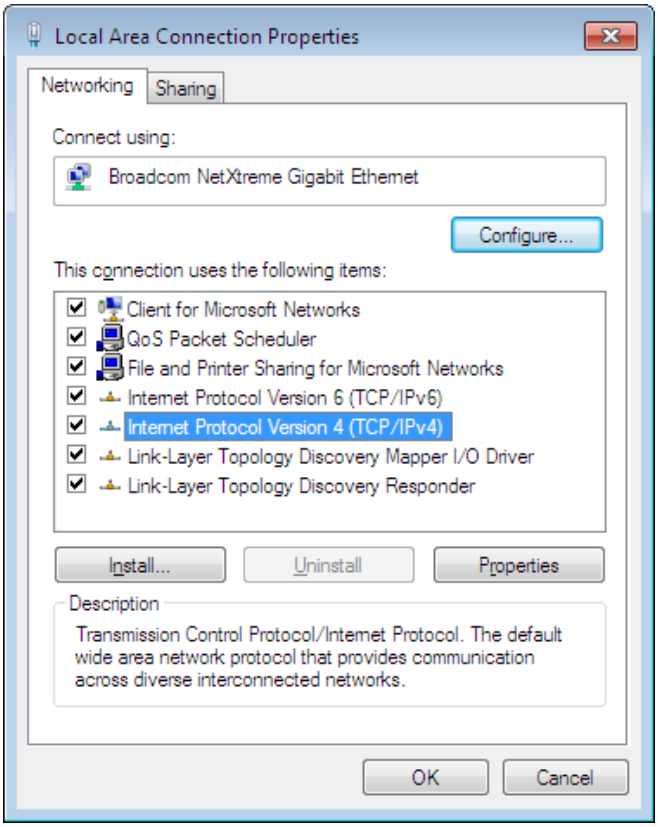
2.8.1 IP Setup for Windows



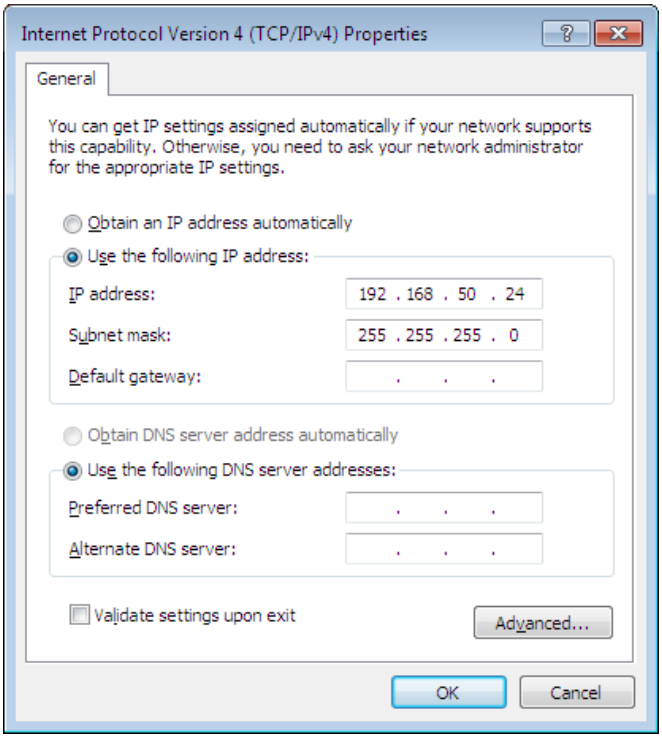
1． Go to: Start -> Control Panel


Control Panel ▸ Network and Internet ▸ Network and Sharing Center
Search Control Panel
Control Panel Home
Change adapter settings
Change advanced sharing settings
View your basic network information and set up connections
See full map
T300-WIN7
(This computer)
Network
Internet
View your active networks
Connect or disconnect
Network
Work network
Access type: Internet
Connections: Local Area Connection
Change your networking settings
Set up a new connection or network
Set up a wireless, broadband, dial-up, ad hoc, or VPN connection; or set up a router or access point.
Connect to a network
Connect or reconnect to a wireless, wired, dial-up, or VPN network connection.
Choose homegroup and sharing options
Access files and printers located on other network computers, or change sharing settings.
Troubleshoot problems
Diagnose and repair network problems, or get troubleshooting information.

2． Navigate to Network and Internet -> Network and Sharing Center



3． Choose Internet Protocol Version 4(TCP/Ipv4) then click Properties button.


Internet Protocol Version 4 (TCP/IPv4) Properties
General
You can get IP settings assigned automatically if your network supports this capability. Otherwise, you need to ask your network administrator for the appropriate IP settings.
Obtain an IP address automatically
Use the following IP address:
IP address: 192 . 168 . 50 . 24
Subnet mask: 255 . 255 . 255 . 0
Default gateway:
Obtain DNS server address automatically
Use the following DNS server addresses:
Preferred DNS server:
Alternate DNS server:
Validate settings upon exit
Advanced...
OK
Cancel

4． Set Internet Protocol Properties

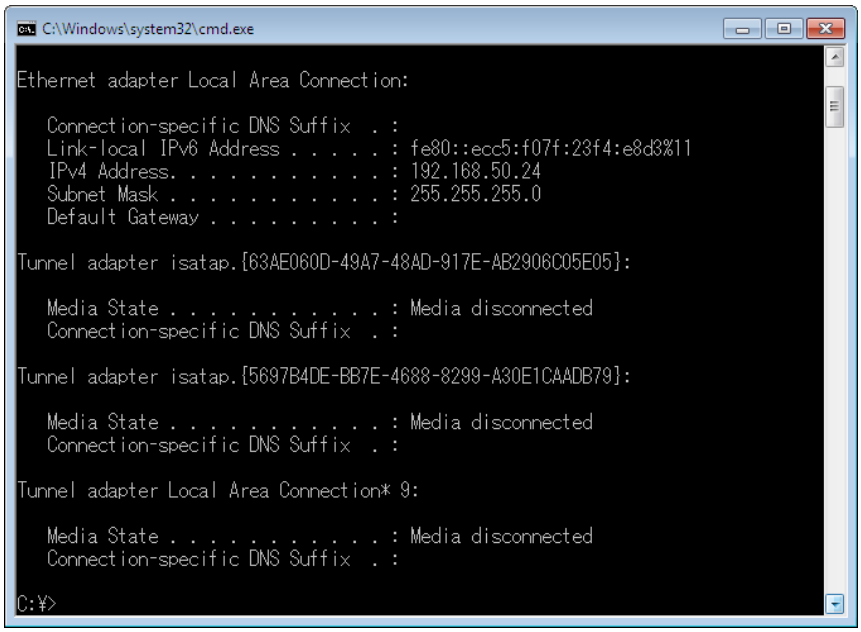
First, check “use the following IO address”. Considering RAID IP ADDRESS is 192.168.50.210 set as follows:

IP address: 192.168.50.XXX (put unused address in place of XXX.)

Subnet mask: 255.255.255.0

Then, click OK button.

● Make sure the IP address used here is not used by another device, or it may not work properly.


C:\Windows\system32\cmd.exe
Ethernet adapter Local Area Connection:
Connection-specific DNS Suffix . :
Link-local IPv6 Address . . . . . : fe80::ecc5:f07f:23f4:e8d3%11
IPv4 Address. . . . . : 192.168.50.24
Subnet Mask . . . . . : 255.255.255.0
Default Gateway . . . . . :
Tunnel adapter isatap.{63AE060D-49A7-48AD-917E-AB2906C05E05}:
Media State . . . . . : Media disconnected
Connection-specific DNS Suffix . :
Tunnel adapter isatap.{5697B4DE-BB7E-4688-8299-A30E1CAADB79}:
Media State . . . . . : Media disconnected
Connection-specific DNS Suffix . :
Tunnel adapter Local Area Connection* 9:
Media State . . . . . : Media disconnected
Connection-specific DNS Suffix . :
C:¥>

５．Confirming the change

１．Start -> enter “cmd.exe” to open command prompt window.

２．Enter ipconfig /renew　３．Enter ipconfig /all　Check if the IP Address has changed correctly.

2.8.2 IP Setup for Linux

１．Open a Terminal Window.

２．Enter # ifconfig eth0 192.168.50.X

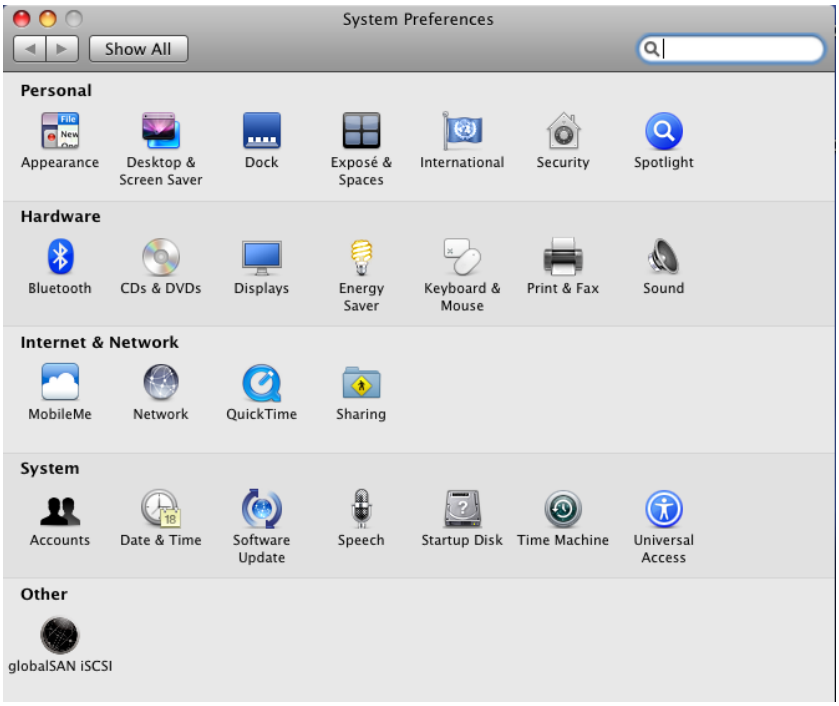
（＊Put IP that is not used in the current network in “X”.)

３．Enter $ sudo dhclient then press enter key.

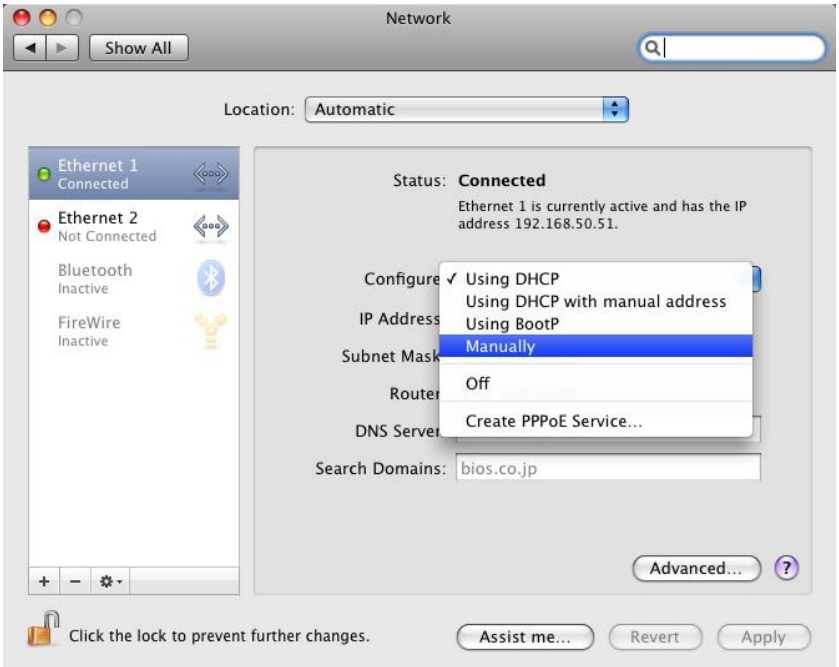
４．Enter #ifconfig to confirm changed IP address

2.8.3 IP Setup for MAC OS X

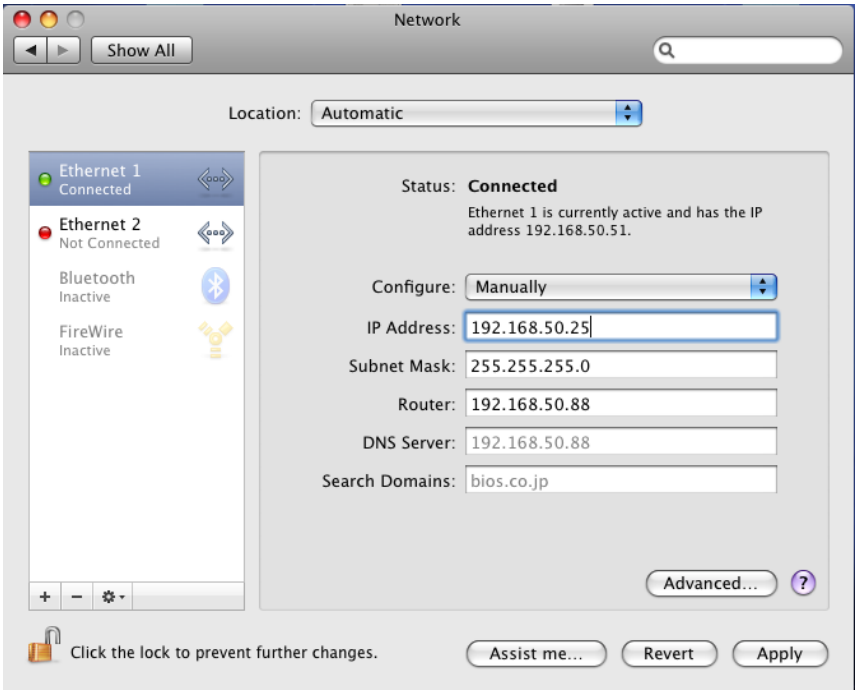
1. Click System Preferences.



2. Click “Network” Icon.



3．Choose Configure option to Manually.



4．Enter IP address and click Apply button to save it.

- **Make sure the address used here is not used by another device.**

Chapter 3. Format

3.1 Linux

The section explains how to use with Linux for reference.
Please refer to Linux OS user guide for details.

1. Login as Superuser

Handling a disk is privileged function for Superuser only. Please login as a Superuser or a.k.a. “root”.

```
<Host name> login: root
Password: ******

Last login: XXX XXX XX XX:XX:XX

…
…

[root@<Host name> /root]#
```

2. Partition Creation and formatting (fdisk command)

① start fdisk

*Example below is when BR256 is recognized as /dev/sdb

```
[root@sheep /root]# fdisk /dev/sdb
```

② Creating partition

*Example below is when creating one partition takes whole disk spaces

```
Command (m for help): n   （n:fdisk のコマンド）
Command action
  e   extended
  p   primary partition (1-4)
p
Partition number (1-4): 1
First cylinder (1-182399, default 1): 1
Last cylinder or +size or +sizeM or +sizeK (1-182399, default 182399): 182399

Command (m for help): p   （p:fdisk コマンド）
```

```
Disk /dev/sda: 255 heads, 63 sectors, 120130 cylindersUnits = cylinders of 16065 * 512 bytes

   Device Boot      Start         End      Blocks   Id  System
/dev/sda1               1      182399  1465119936   83  Linux

Command (m for help): w   （w:fdisk コマンド）
The partition table has been altered!

Calling ioctl( ) to re-read partition table.
Syncing disks.

WARNING: If you have created or modified any DOS 6.x
partitions, please see the fdisk manual page for additional
information.
```

3. Formatting partition created (mke2fs command)

```
[root@sheep /root]# mke2fs /dev/sda1
mke2fs 1.29, 24-Sep-2002 for EXT2 FS 0.5b, 95/08/09
Filesystem label=
OS type：Linux
Block size=4096 (log=2)
Fragment size=4096 (log=2)
183140352 inodes, 366279984 blocks
18313999 blocks (5.00%) reserved for the super user
First data block=0
11178 block groups
32768 blocks per group, 32768 fragments per group
16384 inodes per group
Superblock backups stored on blocks:
    32768, 98304, 163840, 229376, 294912, 819200, 884736, 1605632, 2654208,
    4096000, 7962624, 11239424, 20480000, 23887872, 71663616, 78675968,
    102400000, 214990848

Writing inode tables: done
Writing superblocks and filesystem accounting information: done
[root@sheep /root]#
```

4. Mounting File system

```
[root@sheep /root]#mount /dev/sdb1 /RAID
```

* “/dev/sdb1” is Device partition you are mounting and “/RAID” is the mount point.

3.2 Windows 7

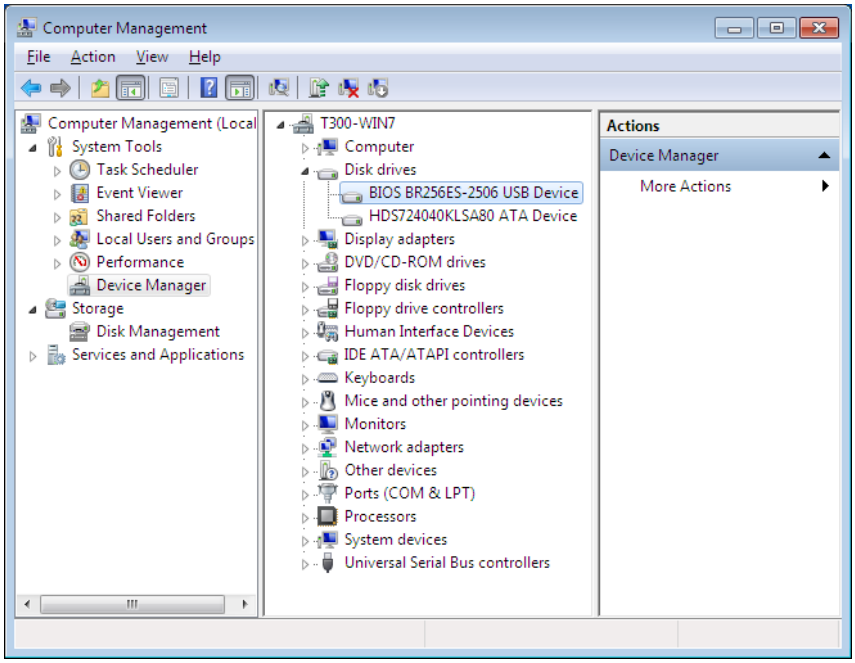
The section explains how to use with Windows 7 for reference.
Please refer to Windows 7 user guide for details.

1. Confirm the connection

① Connect and power on BR256 then starts with host computer.

② Press the Start Button and right-click on “Computer”. Click on “Manage”.

③ Go to “Device Manager”. Click on Disk Drives and confirm that the BR256 has been registered.

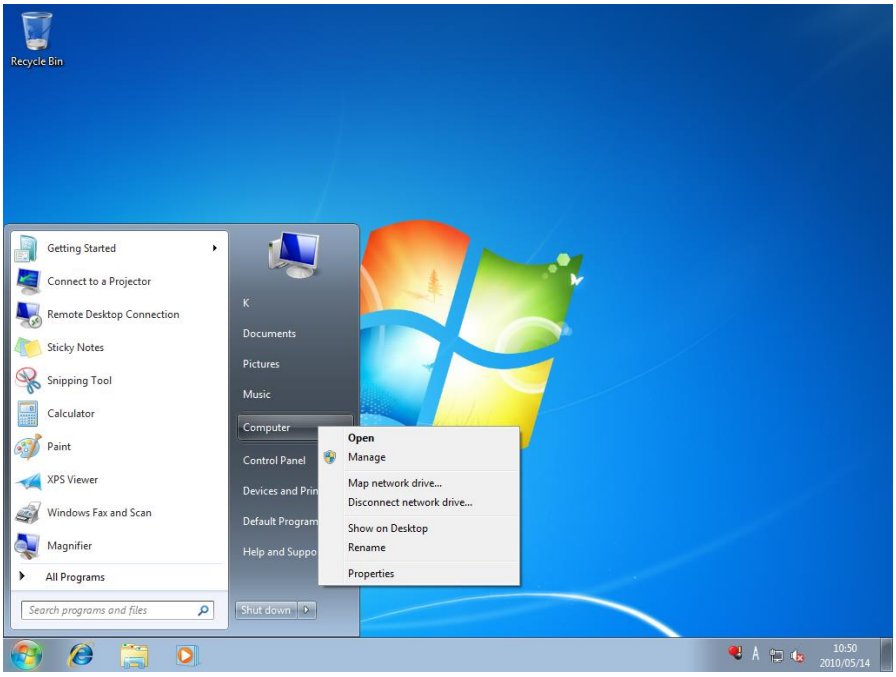


※ If you did not see BR256 here, please check below

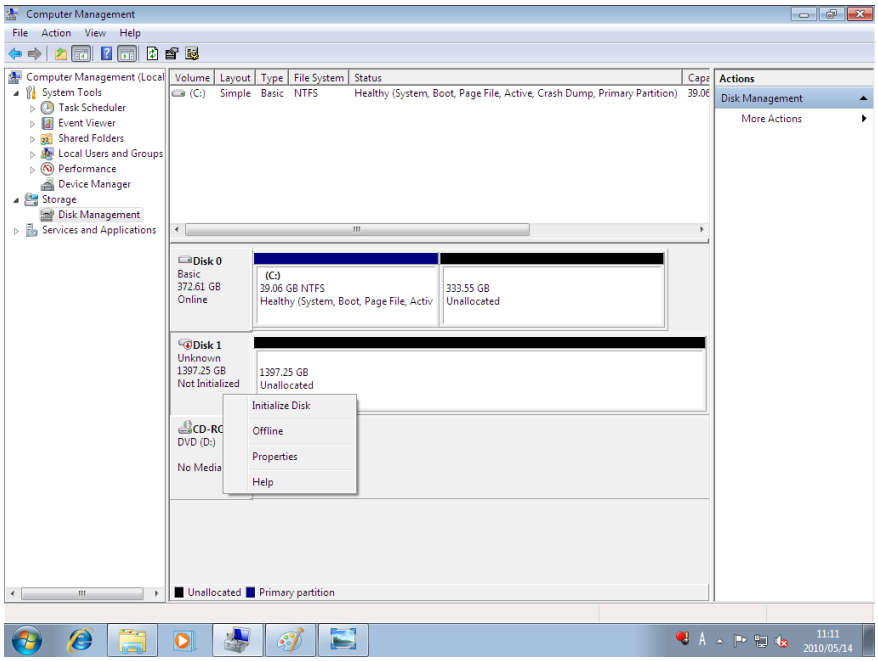
- Is the host HBA recognized by OS or not? （Please consult with your HBA vendor if not）
- Was BR256 normally started and connected?

2. Partition Creation and Formatting

1. Log into Windows 7 and click the Start, then right click on “Computer” and click on “Manage”

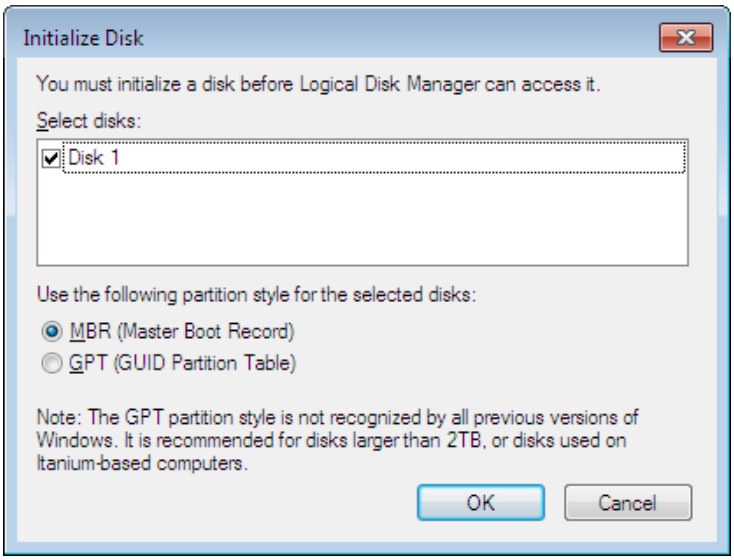


2. Click on “Computer Management” -> “Storage” -> “Disk Management”

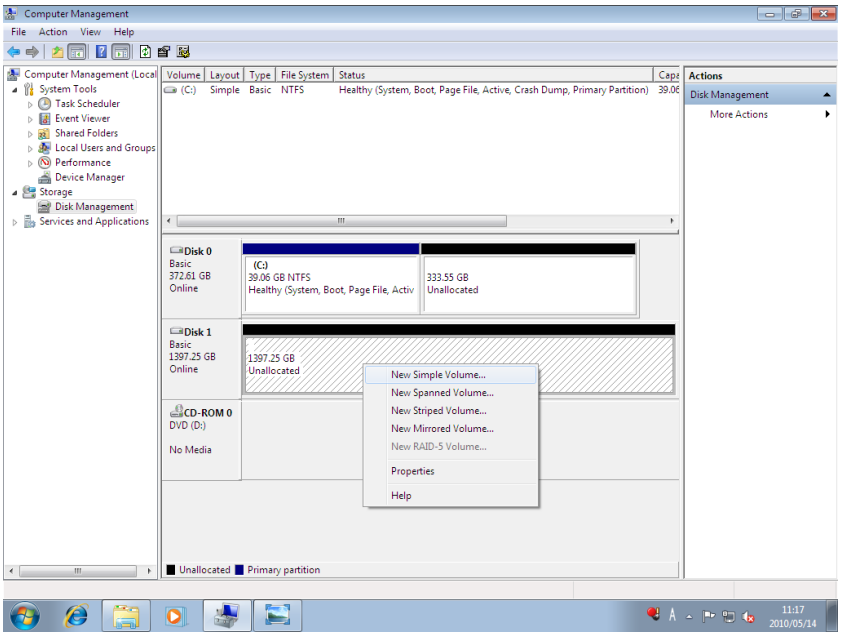


3. Right click Not initialize disk(DISK1)then click「Initialize Disk」.

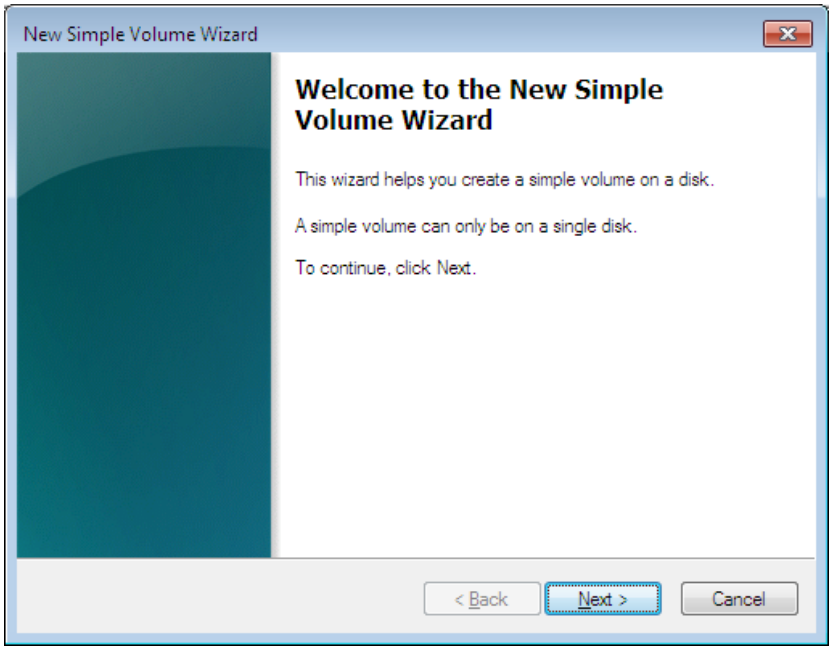
4. Check the disk ☑ to be initialized and move on to the formatting.(If BR256 has capacity over 2TB in Volume then choose GPT Disk label here to able to use disk over 2TB.)


Initialize Disk
You must initialize a disk before Logical Disk Manager can access it.
Select disks:
Disk 1
Use the following partition style for the selected disks:
MBR (Master Boot Record)
GPT (GUID Partition Table)
Note: The GPT partition style is not recognized by all previous versions of Windows. It is recommended for disks larger than 2TB, or disks used on Itanium-based computers.
OK
Cancel

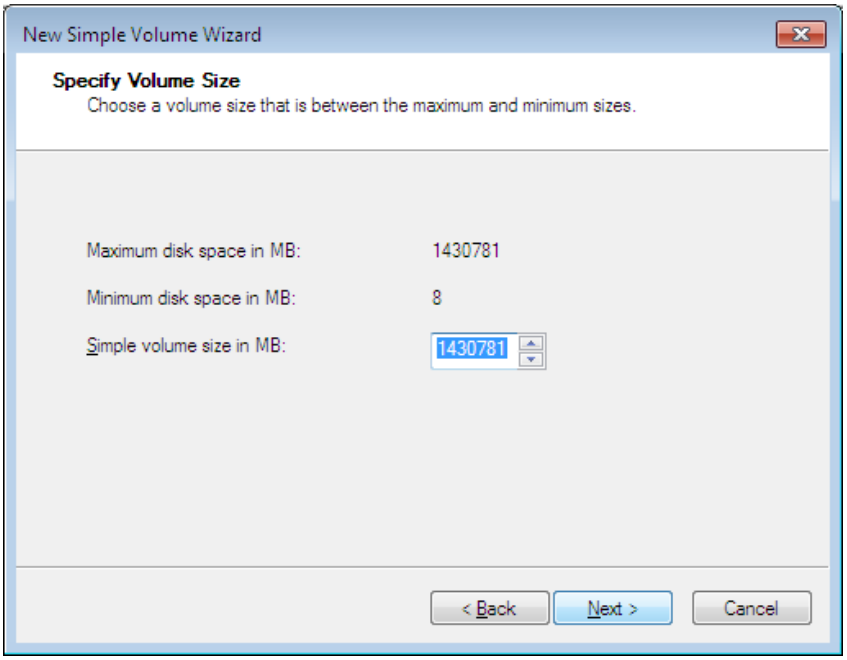
5. Right click on the disk you wish to edit and click “New Simple Volume”



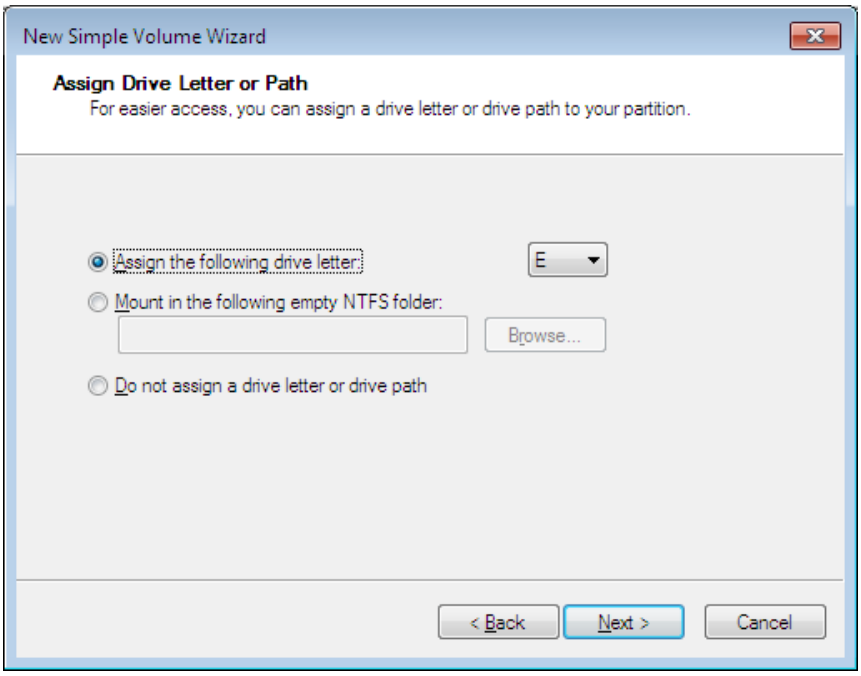
6. The New Volume Wizard will load up, so click “Next”


New Simple Volume Wizard
Welcome to the New Simple Volume Wizard
This wizard helps you create a simple volume on a disk.
A simple volume can only be on a single disk.
To continue, click Next.
< Back
Next >
Cancel

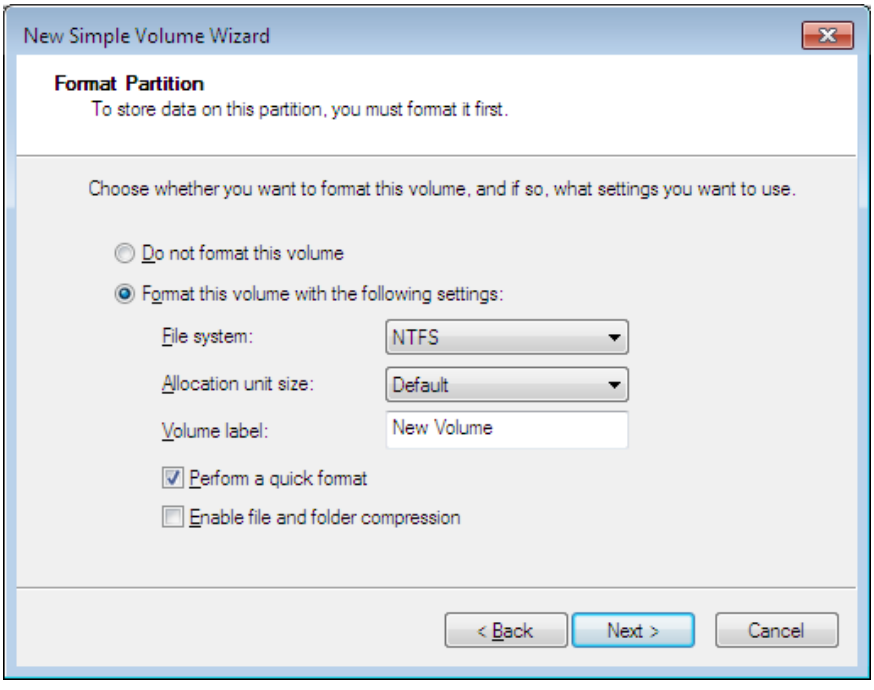
7. Choose the volume you want, then click “Next”.



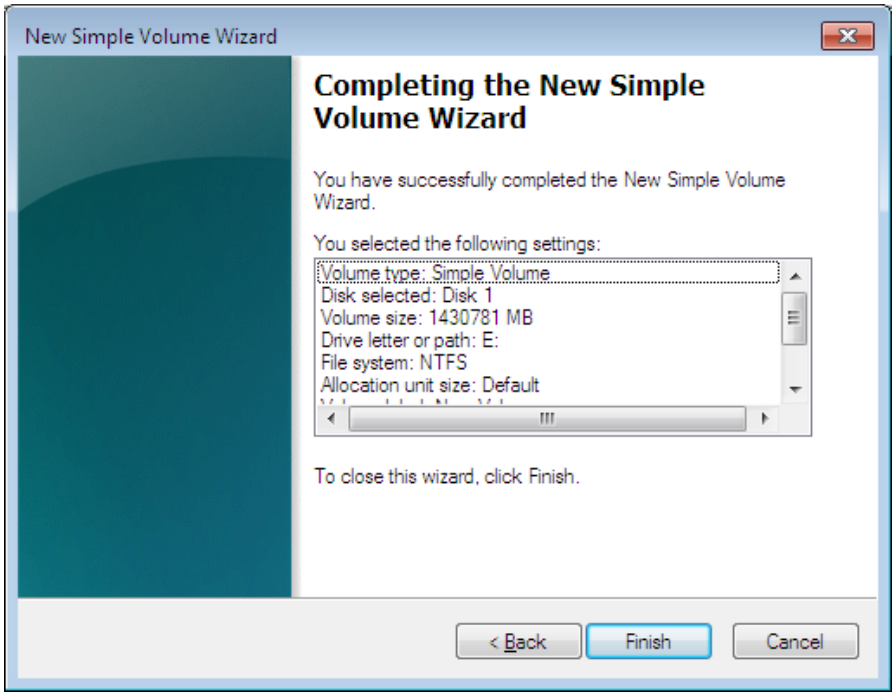
8. Choose the driver letter you wish, click “Next”,


New Simple Volume Wizard
Assign Drive Letter or Path
For easier access, you can assign a drive letter or drive path to your partition.
Assign the following drive letter:
E
Mount in the following empty NTFS folder:
Browse...
Do not assign a drive letter or drive path
< Back
Next >
Cancel

9. Choose the proper formatting settings and click “Next” again.


New Simple Volume Wizard
Format Partition
To store data on this partition, you must format it first.
Choose whether you want to format this volume, and if so, what settings you want to use.
Do not format this volume
Format this volume with the following settings:
File system:
NTFS
Allocation unit size:
Default
Volume label:
New Volume
Perform a quick format
Enable file and folder compression
< Back
Next >
Cancel

10. When you've verified that the settings are correct and there are no errors, click "Finish".


New Simple Volume Wizard
Completing the New Simple Volume Wizard
You have successfully completed the New Simple Volume Wizard.
You selected the following settings:
Volume type: Simple Volume
Disk selected: Disk 1
Volume size: 1430781 MB
Drive letter or path: E:
File system: NTFS
Allocation unit size: Default
To close this wizard, click Finish.
< Back
Finish
Cancel

11. The format will begin.
    Close the "Computer Management" after the format has completed.

※ You can use the disk now, please remember the disk name you made

3.3 Other OSs

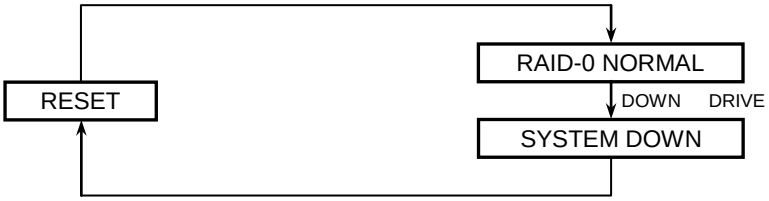
Please refer to the user manual of associated vendors.

Chapter 4. BR256 State Transition

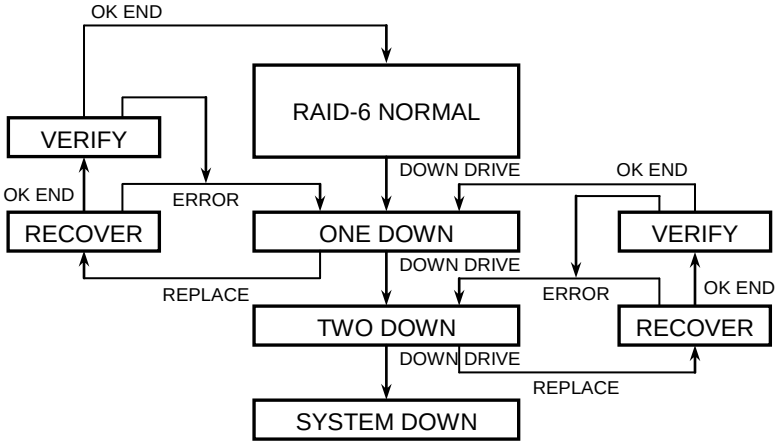
4.1 Overview of Disk Array State Transition

Any time the array transfers from NORMAL state to FAIL state, the alarm buzzer will sound, and the Fault LED will light up. At this point, pressing the Mode button will stop the buzzer.

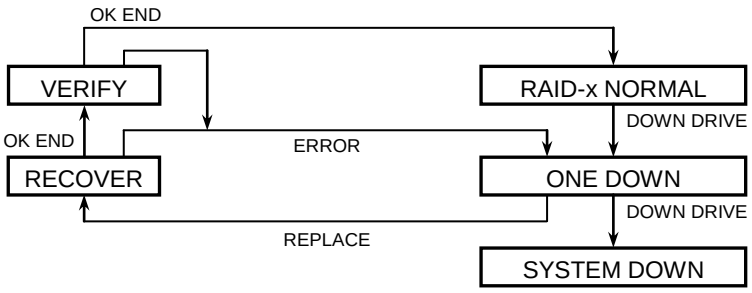
＜RAID-0 State Transition＞



＜RAID- 6 State Transition＞



＜RAID- 3 / 5 State Transition＞



Force Reset（Initialization）

If you force reset by powering on while holding down the MODE switch, all active drives will be returned to their normal state. If all drives are active, the system will return to NORMAL. This should be applied when it is the first time to initialize the disk array

At this time, the actual health of the disks will not be verified. All drives are assumed to be healthy.
If you would like to force reset right after [ONE DOWN] or [SYSTEM DOWN] reported, please follow instruction of qualified technical support staff. While the array is in「ONE DOWN」or「SYSTEM DOWN」, if you operate incorrectly, there might be chance to cause data corruption.

Force Reset（Transition from「SYSTEM DOWN」）

If there is a damaged drive, contact our technical support staff for further assistance.

Below is an example of typical operation

- After removing the damaged drive, hold the Mode switch at powering on and force reset the machine. It will set up a most appropriate state for the unit
  - ・DRIVE FAIL LED still on, means that drive was the first to go down. Please remove it first
  - ・DRIVE FAIL LED blinking, that drive went down afterwards so keep it installed. Hold down the Mode switch and power cycle the machine for possible recovery
  - ・ In a RAID-3/5 configuration, it will go back to ONE DRIVE DOWN status.
- It is sometimes possible to access the system even during SYSTEM DOWN.
  Under such state, please try to access and backup data out of the array
- If nothing's working, replace all the drives you think might be bad, and start over with a force reset (Initialization).

Parity Drive

- Under RAID-3 configuration, Data drives and Parity drive are arranged in a sequential order. Parity drive follows the last of data drive.

4.2 Deal with「ONE DRIVE DOWN」state

Under RAID- 6 / 3 / 5 configuration, there are times that BR256 might enter into 「ONE DOWN」state.
BR256 will then suspend the drive to avoid data corruption. This should not affect the data access.

■ How to fix it

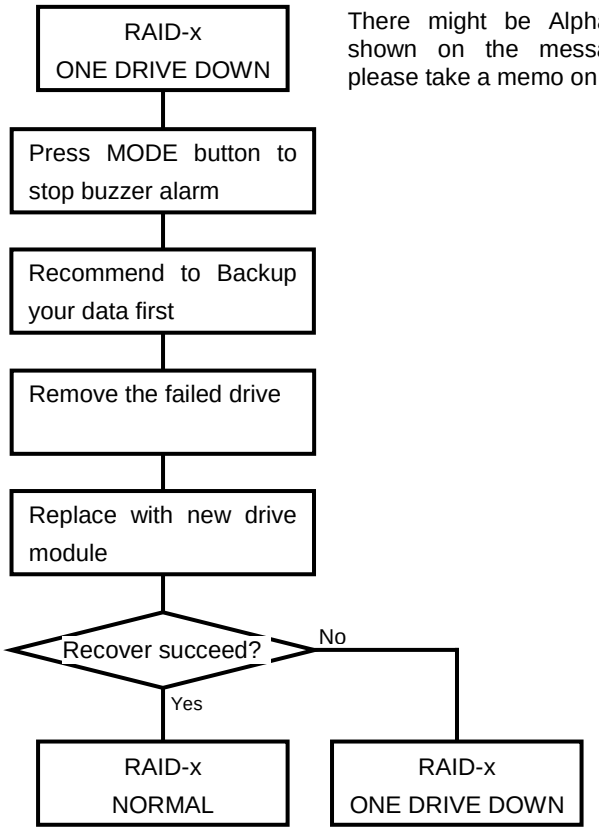
①Press MODE button to stop buzzer

②It is recommended to backup your data before performing recovery.
There is possibility that the system might not work normally during recovery process even after power recycling.

③Remove failed drive and replace with new drive module.

④「RAID-x RECOVERING 0%」will be shown meaning Recover is started.

⑤When recovery is succeeded, LCD will display 「RAID-x NORMAL」.If it did not return to NORMAL state, please contact your support window for service.



※ User can try to replace the suspicious HDD with a new one. If the situation remains unchanged, you should contact your support.

4.3 Deal with「TWO DRIVE DOWN」

Under RAID 6, for some reasons, there might be possibility that another drive failed after「ONE DRIVE DOWN」, then 「TWO DRIVE DOWN」will be shown. Same as 「ONE DRIVE DOWN」, the drive might be temporary failed. Follow the similar process to clarify it.

■How to fix it

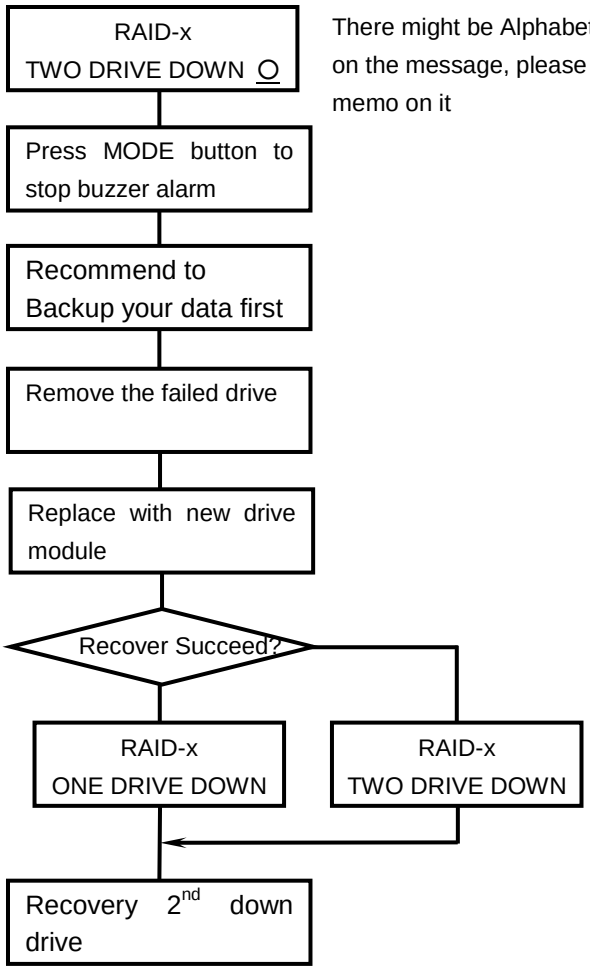
① Press MODE button to stop buzzer

② It is recommended to backup your data before performing recovery. There is possibility that the system might not work normally during recovery process even after power recycling.

③ Remove one failed drive and replace with new drive module.

④ Within 3 minutes, 「RAID-x RECOVERING 0%」 will be shown meaning Recovery process stared. When 「RAID-x ONE DRIVE DOWN」 is shown, you can start with recovery of 2nd drive.

⑤ When recovery is succeeded, LCD will display 「 RAID-x NORMAL 」 .If this happened frequently, please contact your support window for service. .If it did not return to NORMAL state, please contact your support window for service.


RAID-x
TWO DRIVE DOWN O
There might be Alphabet shown on the message, please take a memo on it
Press MODE button to stop buzzer alarm
Recommend to Backup your data first
Remove the failed drive
Replace with new drive module
Recover Succeed?
RAID-x
ONE DRIVE DOWN
RAID-x
TWO DRIVE DOWN
Recovery 2nd down drive

4.4 How to deal with「SYSTEM DOWN」

When「SYSTEM DOWN」occurred, data was assumed to be corrupt and could not be recovered.

> **Please suspend data write**
> When「SYSTEM DOWN」occurred during writing data, the data is not considered reliably. Please write the date again after system recovery.

■ Steps to check for RAID 0

① Press MODE button to stop buzzer

② It is recommended to backup your data before performing recovery. There is possibility that the system might not work normally during recovery process even after power recycling.

③ Stop the application and Shutdown host computer

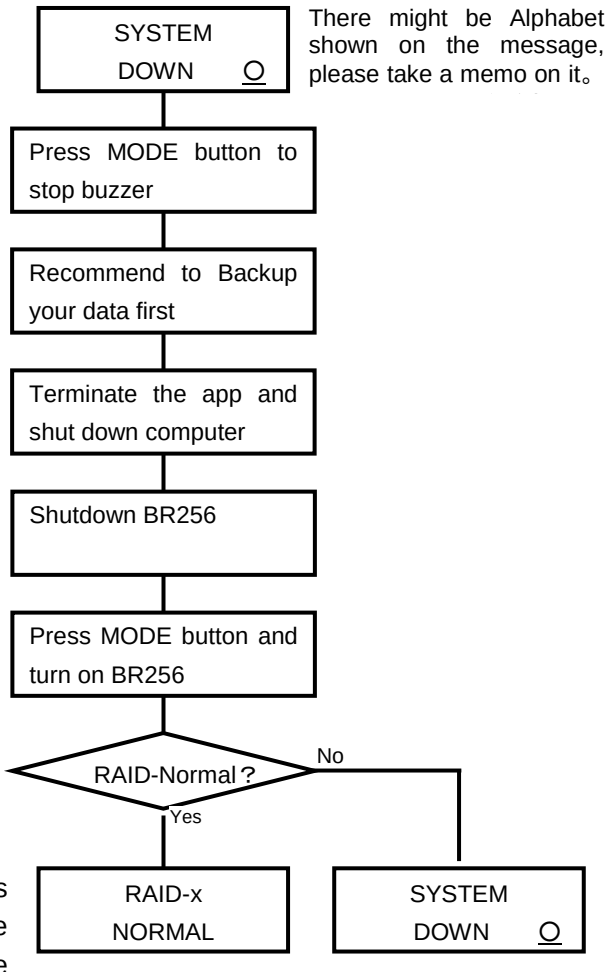
> If the system hang up during the normal shutdown process, please remain system power-on and contact your support window. There might be possibility that data will be corrupted.

④ Shutdown both computer and BR256

⑤ Press and hold the MODE button then turn on BR256 power

⑥ If LCD showed「RAID-x NORMAL」, it means BR256 came back to normal. There might be temporary contact error between HDD and the backplane. If the system did not come back to normal, or 「SYSTEM DOWN」is encountered soon, you should contact your support window.

※ User can try to replace the suspicious HDD with a new one. If the situation remains unchanged, you should contact your support.


SYSTEM DOWN ○
There might be Alphabet shown on the message, please take a memo on it。
Press MODE button to stop buzzer
Recommend to Backup your data first
Terminate the app and shut down computer
Shutdown BR256
Press MODE button and turn on BR256
RAID-Normal？
No
Yes
RAID-x NORMAL
SYSTEM DOWN ○

■ Steps to check for RAID-6

①Press MODE button to stop buzzer

② It is recommended to backup your data before performing recovery. There is possibility that the system might not work normally during recovery process even after power recycling.

③ Stop the application and Shutdown host computer

> If the system hangs up during the normal shutdown process, please remain system power-on and contact your support window. There might be possibility that data will be corrupted.

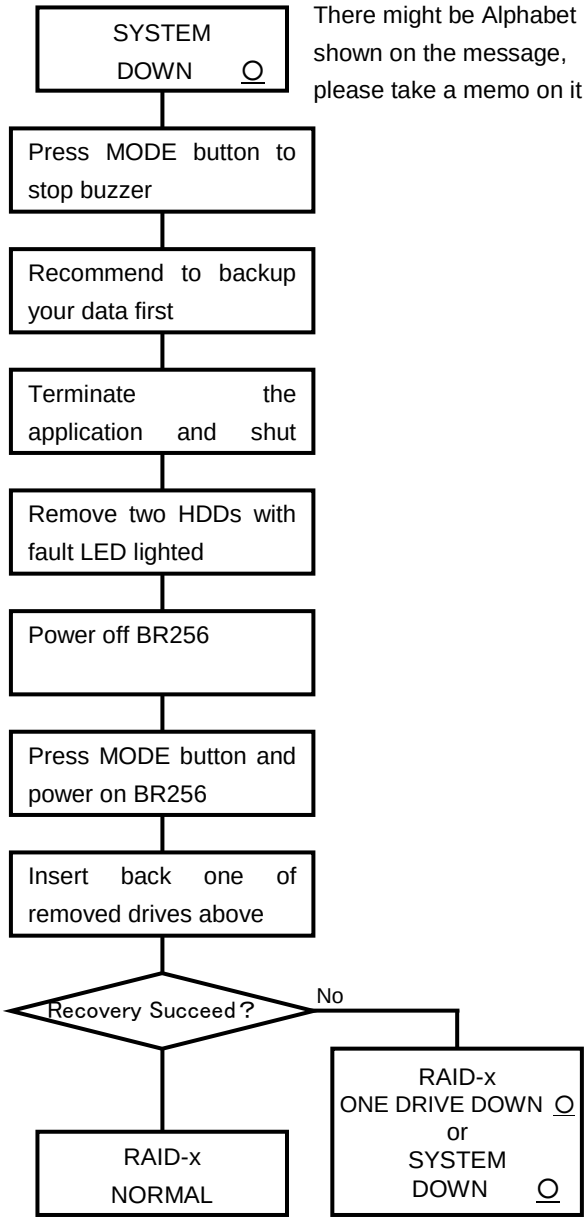
④ Please remove two drives with Fault LEDs on （Not to remove the drive with LED blinking）

⑤ Power off BR256

⑥ Press and hold the MODE button then turn on BR256 power. Please check if LCD showed 「RAID-x TWO DRIVE DOWN」

⑦Insert one of removed drive

⑧ Within several seconds、「RAID-1 RECOVERING 0%」should be shown on LCD. During the recovery, there should be character 「R」、「X」、「Y」or blank character shown following the % on LCD, it might mean the drive connection is problematic. In such case, turn off the power and do not insert two failed drives. Start with step 6 again.


SYSTEM DOWN O
There might be Alphabet shown on the message, please take a memo on it
Press MODE button to stop buzzer
Recommend to backup your data first
Terminate the application and shut
Remove two HDDs with fault LED lighted
Power off BR256
Press MODE button and power on BR256
Insert back one of removed drives above
Recovery Succeed?
No
RAID-x NORMAL
RAID-x ONE DRIVE DOWN O or SYSTEM DOWN O

⑨ When LCD shows「RAID-x ONE DRIVE DOWN」, you can move to next step following instruction of section 4.2 continue with recovery from「One Drive Down」State

You should contact support window the status never became 「RAID-x ONE DRIVE DOWN」

※ User can try to replace the suspicious HDD with a new one. If the situation remains unchanged, you should contact your support.

To recover two failed drives one by one till LCD shows「RAID-x NORMAL

■ Steps to check for RAID-3 / 5

①Press MODE button to stop buzzer

②It is recommended to backup your data before performing recovery. There is possibility that the system might not work normally during recovery process even after power recycling.

③Stop the application and Shutdown host computer

> If the system hang up during the normal shutdown process, please remain system power-on and contact your support window. There might be possibility that data will be corrupted.

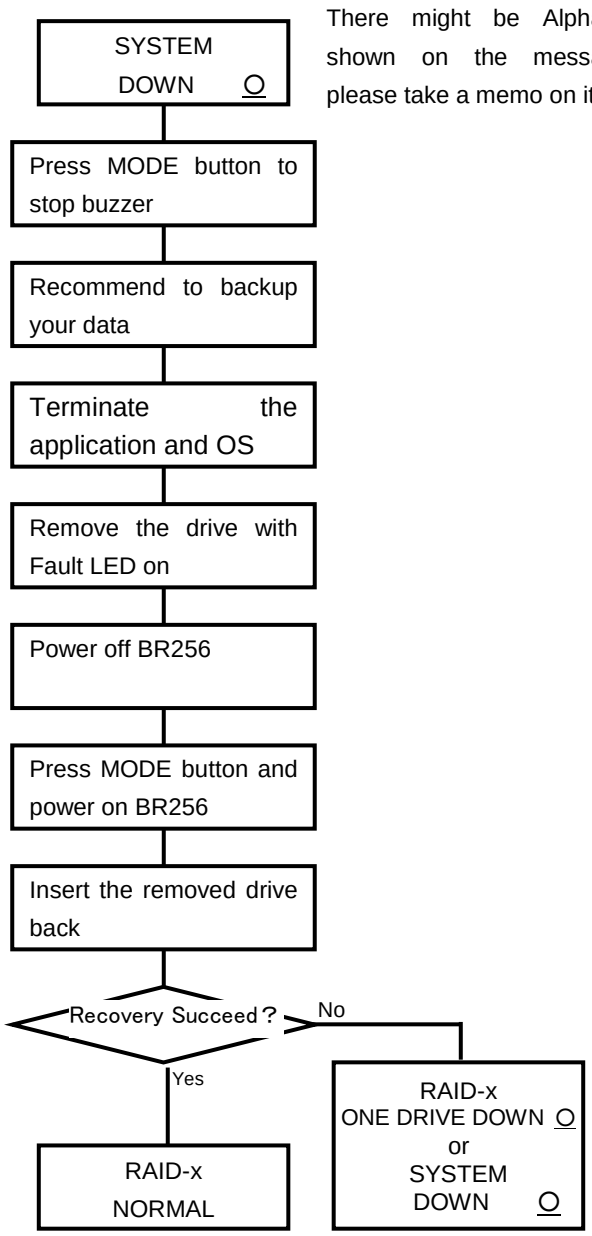
④ Please remove the drive with Fault LEDs on （Not to move the drive with LED blinking）

⑤ Turn off BR256

⑥ Press and hold the MODE button then turn on BR256 power. Please check if LCD showed 「RAID-x ONE DRIVE DOWN」

⑦ Insert the removed drive back

⑧ Please check if LCD showed「RAID-x RECOVERING 0%」after seconds. During the recovery, there should be character「R」、「X」、「Y」or blank character shown following the % on LCD, it might mean the drive connection is problematic. In such case, turn off the power and remove the failed drive, starting with step 6 again.


SYSTEM DOWN O
There might be Alphabet shown on the message, please take a memo on it
Press MODE button to stop buzzer
Recommend to backup your data
Terminate the application and OS
Remove the drive with Fault LED on
Power off BR256
Press MODE button and power on BR256
Insert the removed drive back
Recovery Succeed?
No
Yes
RAID-x NORMAL
RAID-x ONE DRIVE DOWN O or SYSTEM DOWN O

⑨ If LCD showed「RAID-x NORMAL」, it means BR256 came back to normal. There might be some temporary disconnections between HDD and Backplane. If the system did not come back to normal, or 「SYSTEM DOWN」is encountered soon, you should contact your support window.

※ User can try to replace the suspicious HDD with a new one. If the situation remains unchanged, you should contact your support.

4.5 LCD Display Under Normal Operation

When all hard disks work normal, LCD will display normal status as below.

SINGLE DRIVE NORMAL	RAID-1 NORMAL	RAID-0 2 DRIVE NORMAL
RAID-1 3 DRIVE NORMAL	RAID-0 NORMAL	RAID-10 NORMAL
RAID-6 NORMAL	RAID-3 NORMAL	RAID-5 NORMAL

4.6 LCD Display for Disk Error

RAID-x
ONE DRIVE DOWN

This means host access is working under one failed drive status.（This won't be seen on RAID-0 mode）
Please check disk FAIL LED to identify the failed drive. Press MODE button to stop buzzer alarm.

RAID-x
TWO DRIVE DOWN

This means host access is still working under 2 failed drives status.
（This will only be seen in RAID-6 mode）Please check disk FAIL LED to identify the failed drive. Press MODE button to stop buzzer alarm.

SYSTEM
DOWN

This will be shown if 3 drives failed in RAID-6 mode or 2 drives failed in RAID-3/5 mode, or one drive failed in RAID-0 mode. The controller will do its best to handle host command, but normal operation is not guaranteed. Please check disk FAIL LED to identify the failed drive. Press MODE button to stop buzzer alarm.

4.7 LCD Display for Disk Drive Recovery Status

The drive recovery and verification progress will be shown from 0%, 1% to 99% before completion. When the process is completed, 「RAID-x NORMAL」 will be shown on LCD.
LCD will keep displaying「ONE DOWN」before recovery process has been started.
FAIL LED of associated drive will keep light on till the completion of recovery operation.

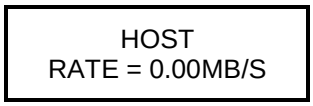
4.8 LCD Display for FAN Failure

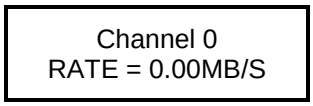
When FAN is failed, system FAIL LED will be lighted up and buzzer will be turned on.
Push MODE button to stop the buzzer alarming. If you keep operating BR256 under fan failed situation, temperature inside the enclosure will be raised and will cause system malfunction or HDD failure. Please contact support people for the fan replacement right after its failure.

4.9 Others LCD Display

4.9.1 Transfer Rate Display

This section explains how to get into display of current data transfer rate. Press MODE and SELECT button at the same time during operation. Push SELECT button once slowly after Firmware version shown to read Host transfer rate. Then you can check every Drive access speed by pressing MODE button. Data transfer rate is checked every 0.5 sec.

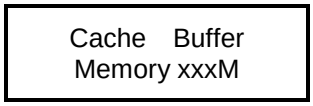




Not only useful for checking data transfer rate, this is also useful to check if Activity LED worked normally or if HDD hang-up is suspected. RATE display will be exited if SCSI reset command was received. Or you can press MODE and SELECT button at the same time to return to earlier state.

4.9.2 Cache Check Display

When BR256 got into RATE check mode, press MODE button again after checking disk access rate. The LCD will display Cache memory check by Megabyte.（same as power on cache memory check）



4.9.3 Most Delay CH Display

Following cache memory check, LCD will display the disk channel with longest delay by pressing one more MODE button. This access delay is derived from internal retry inside the disk. Disk replacement is highly recommended if same drive kept having the slowest response.

（This is to show drive with many Retry）

4.9.4 LCD Display for Patrol Mode Options

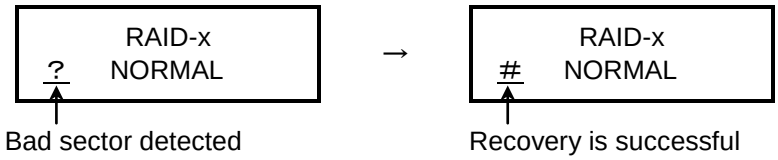
Following Most Delay CH, Patrol Mode switching can be chosen by pressing MODE button. You can push SELECT button to switch among 3 different patrol modes

1. NO PATROL Mode

No Patrol.

2. AUTO PATROL Mode

When access from the host is cut off for more than 0.1 seconds, a read will be attempted on every drive once every amount of time that's specified in the [SYSTEM PATROL WAIT TIME] option.
The READ will not be executed when access is continuous. If a bad sector is found on a drive, it will be fixed with the data from another, properly operating drive.



（The display interval of "?" might be too short to see）

3. FORCE PATROL Mode

When there is no access from the host, continuous READ operation will be applied to all drives, and if any error sector was found they will be automatically recovered. Even when the host access is continuous, a read will be attempted on all drives once every amount of time that's specified in the [SYSTEM PATROL WAIT TIME] option. When it gets to 100%, depending on the specified parameters it will either return to [AUTO HDD PATROL] or [NO HDD PATROL].

FORCE PATROL - Effective usage（Incoming test or regular scanning）
It allows you to do self-check on all disks despite of the disk status. It is suggested to do as an incoming inspection or regularly planning.

※ Even if you chose [NO HDD PATROL] when setting your parameters, it is possible to change to PATROL mode during use. Patrol function will not work during Disk Down (or Recover) states.
The mark that indicates a successful rewrite, (#), disappears when you press the MODE and SELECT buttons at the same time. Patrol will be restarted from LBA0 when Disk state changed from Down (or Recover) to Normal.

4.9.5 LCD Display for Ethernet Setup

Ethernet setup display will come up following pushing MODE button once after Patrol mode.
By pressing MODE button, Ethernet related setting will be displayed one by one. Parameters can be changed except MAC Address.

MAC Address 0008 : 23 : 00 : XX : XX	
IP Address 192. 168. 50. XX	（Changeable）
Address Mask 255. 255. 255. 0	（Changeable）
Gate Way Address 255. 255. 255. 255	（Changeable）

Push MODE button again to return to Transfer RATE display.

4.10 LCD Display for Controller Error

Here explains error shown on LCD display. Buzzer alarm will be sound and can be stopped by pushing MODE button.

If below error was observed, you should disconnect BR256 from host and contact your support window.

● **Please take a memo on error message**

Notice: Error message will be cleared after power down

● **Dispatch Error**

Dispatch Nesting Error	Error occurred during Dispatch routine

● ROM Reading Error

Code ROM Error System Halted	ROM（Flash EPOM）checksum error Usually this will only happen at power on.

● Working RAM Error

Work RAM Error System Halted	Error occurred on working area of RAM Usually this will only happen at power on.

● Divide by Zero Error

Divide or FPP or Invalid Code Err	For certain calculation, divide by zero error

● Undefined Interrupt Error

SYSTEM INTERRUPT Error	Undefined interrupt error
SYSTEM SBI INT Occur	System break error。
SYSTEM RIE INT：0x000	This is displayed when a Reserved Instruction Exception has occurred.
SYSTEM AE INT：0x000	Address exception error
SYSTEM TRAP Error	Undefined trap process error

● Cache buffer queue management error

Buffer Manager Queue Error	Error happens on cache buffer management routine

● **Cache buffer check error**

Cache Buffer Error 0x########

Error happens on data access during cache check

● **Cache buffer size error**

Buffer Size Error

This is displayed when a data mismatch occurred during a Cache Buffer Check

● **Cache buffer size error**

Buffer Manager Link Error

This is displayed when a data mismatch occurred during a Cache Buffer Check

■ **Extra error indication appended to ONE DOWN/SYSTEM DOWN (drive error)**

Hardware Error

r	IDE register read / write
A	disk dma time out ? no pend in exe auto
B	bad block detected
C	uncorrectable error detected
D	data transfer requested
E	IDE drive busy in start
I	ID not found
M	data address mark not found
O	command aborted
R	IDE drive ready time out
S	unable to find track 0
T	(dummy)busy time out or so
Y	disk not present in write
Z	(dummy)other error
z	other error
L	capacity error
X	disk not present in operation without write

Software Error

U	undefined command error
E	chip busy soft error

※There is high possibility of drive error when you see「S」、「Z」、「z」. Please remain power on and contact support.

4.11 Retry Error Detection/Drive SENSE DATA Display

> ⚠ ● **Please take a memo on error message**
> Notice: Error message will be cleared after power down

When a retry occurs, the retry mark will be displayed. When there is a possibility that something on the host, or drive side could damage the data, the BR256 will cause the drive to stop, but when a Read or Write error occurs, it will attempt a read and write retry in order to see if it was an accidental error or a real problem. These retry marks can be cleared by pressing the MODE and SELECT switches simultaneously while the BR256 is in normal operation to enter Parameter display mode, and then pushing them both once again.

```
RAID-6
NORMAL  _
```

P – A parity error occurred in the host Bus during the completion of the data out phase
Q – A parity error occurred in the host Bus during the middle of the data out phase
R – A parity error occurred in the host SCSI Bus during the data in phase
I – The initiator detected an error and stopped the operation sequence.
: – An error was detected during data out and check conditioning was completed.
. – A retry was successful during writing.

```
RAID-6
_  NORMAL
```

: – An error was detected during data in and check conditioning was completed.
. – A retry was successful during the read process.
! – A Rewrite was successful during the read process.

Usage of MODE and SELECT Button

After a retry (drive accesses retry) has occurred in the Read/Write process, you can push the SELECT switch to see the retry message.

Read Retry in CH # Err Code = x

Write Retry in CH # Err Code = x

CH 0	Drive No. 0
CH 1	Drive No. 1
CH 2	Drive No. 2

CH 3	Drive No. 3
CH 4	Drive No. 4
CH 5	Drive No. 5

When a drive is down, an Error Sense Code will be displayed, so please hit the SELECT button. (Sub-message)

Channel # Occur error x

[#] is the number of the drive where the retry occurred; [x] indicates the root cause.

[4.10 Array Controller Error Messages]

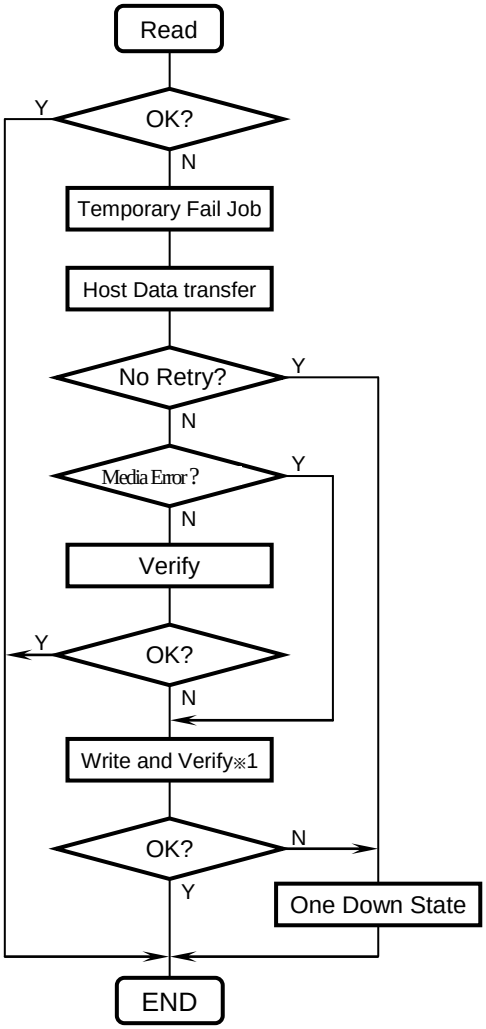
■ONE DOWN/SYSTEM DOWN」additional error message

When [ONE DRIVE DOWN] or [SYSTEM DOWN] status occurs, you can hit the select button to see the Sense Data sub-message. If you hit MODE and SELECT switches simultaneously twice, the retry message will disappear. (But the sub-message will remain.)

If it happens again, you can assume something's wrong with the drive or the host. You should contact support for service.

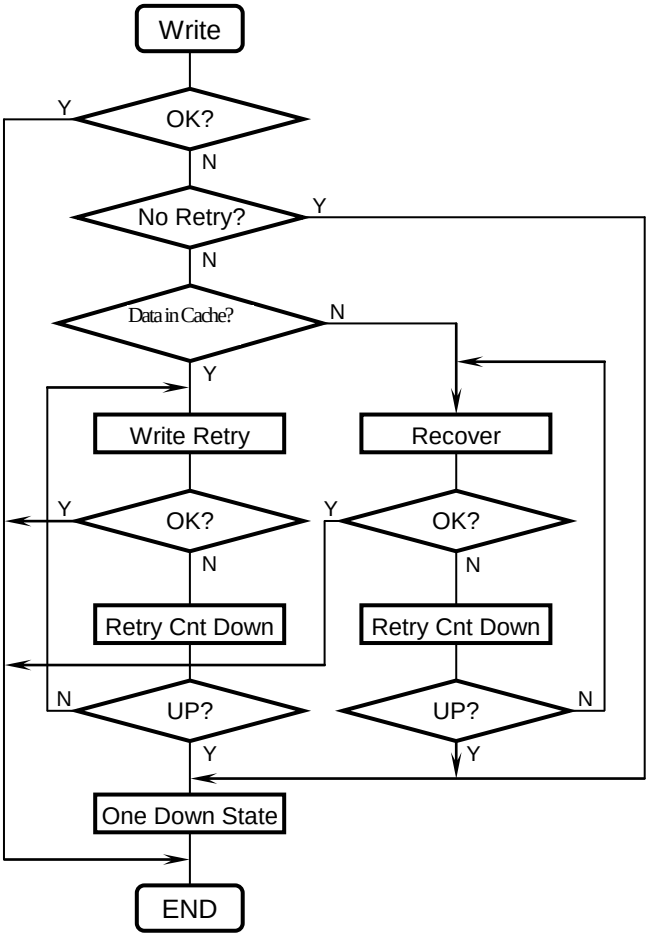
Data Read Process

Normal Read Flow



Data Write Process

Normal Write Flow



Display Retry Error

※1： ! Mark (Rewrite)

4.12 Other Error

Array controller is considered to have hardware or software fault if any other error occurred. Record the display content and BR256 status then contact your support window. Most of time, the system could be recovered after host reset.

Appendix

1. Product Specification

Model		BR256-2506	BR256-5006
RAID Mode		6 / 0 / 3 / 5 / 1 / 0-2 DRIVE / 1-3 DRIVE / 10 / SINGLE DRIVE	
Capacity	RAID-0 RAID-6 RAID-3 / 5	1.5TB 1TB 1.25TB	3TB 2TB 2.5TB
Drive		250GB×6	500GB×6
Interface		eSATA, USB3.0, USB2.0	
Maximum Speed		eSATA：3Gbps（theoretical）, USB 3.0: 5Gbps (theoretical), USB2.0：480Mbps（theoretical）	
Cache Size		128 MB	
Logical Unit		LUN：max 8、Support 1 LU more than 2TB	
Power Input		AC100～240V±10%、47～63Hz、Full range	
Power Consumption		Maximum(startup)：43W, Idle：25W, Operation：32W (※Vary from hard disk)	
Dimension		126 mm（W） × 162 mm（H） × 205 mm（D）	
Weight		about 3.5 Kg	
Accessory		AC Power cable, eSATA cable, USB3 cable, drive key, Quick Installation Guide, User Manual(CD-R only)	

■ **Operating Environment**

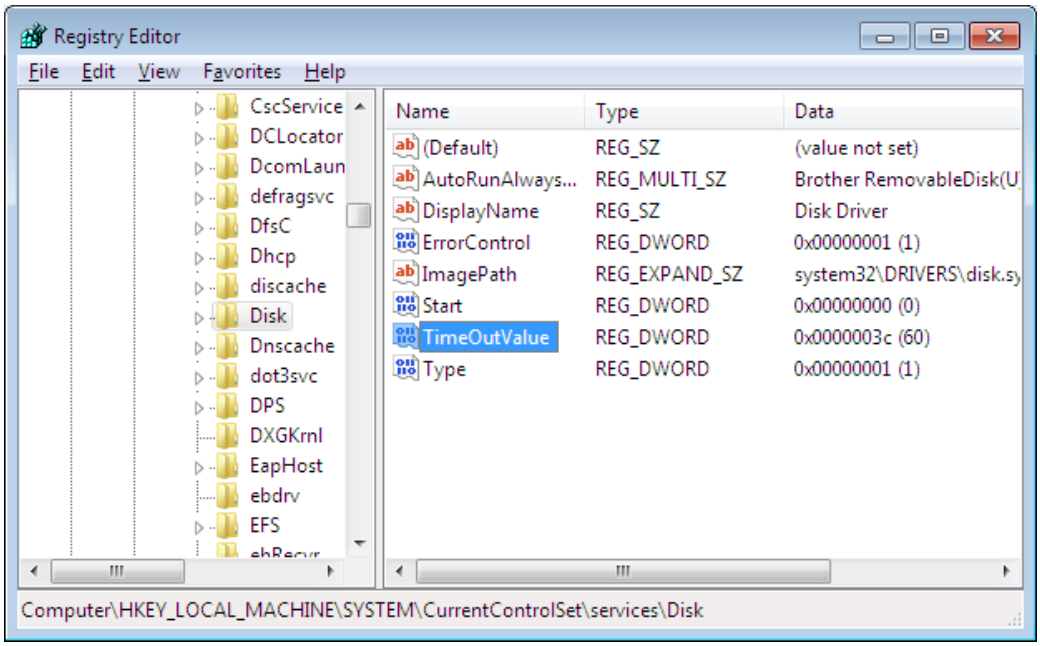
Ambient Temperature	Operating ： 5 ～ 35 ℃ Storage ：– 40 ～ 60 ℃
Humidity	Operation ： 20 ～ 80 % Storage ： 5 ～ 95 %
Dust	General office environment
Shock	Operating ： 5 G Storage ： 50 G
Altitude	Operating ： 0 ～ 3000 m Storage ： 0 ～ 12000 m

2. Disk Time Out Value Setup

From Windows Menu go to [Start] -> [Run] and enter [regedit] to start register editor:
Go to:
HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\Disk\
In general, 60 second（hex:3c） is the most popular setting

*If there is no TimeOutValue registry at the above location then create new one as DWORD then put name as [TimeOutValue] then value as [3c] in hex format

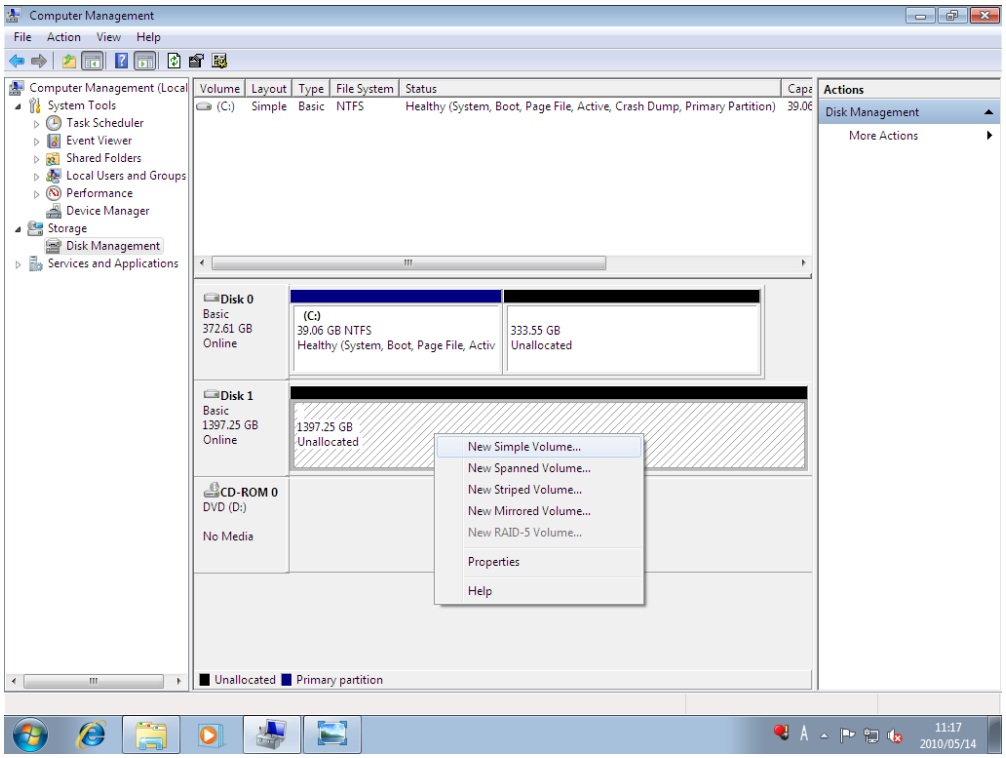
Please refer to following link for further information:
http://technet.microsoft.com/en-us/library/aa997069(EXCHG.80).aspx



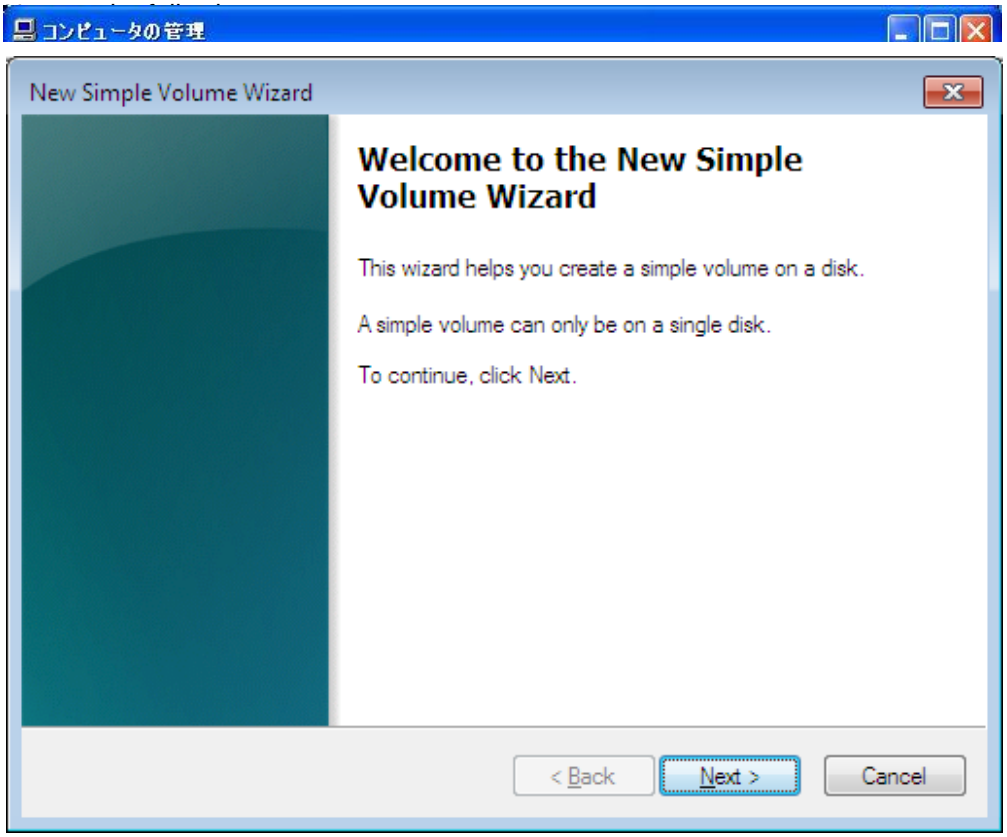
3. How to change Cluster size(Allocation Unit Size) during Format under Windows OS

①Right click on My Computer and select Manage

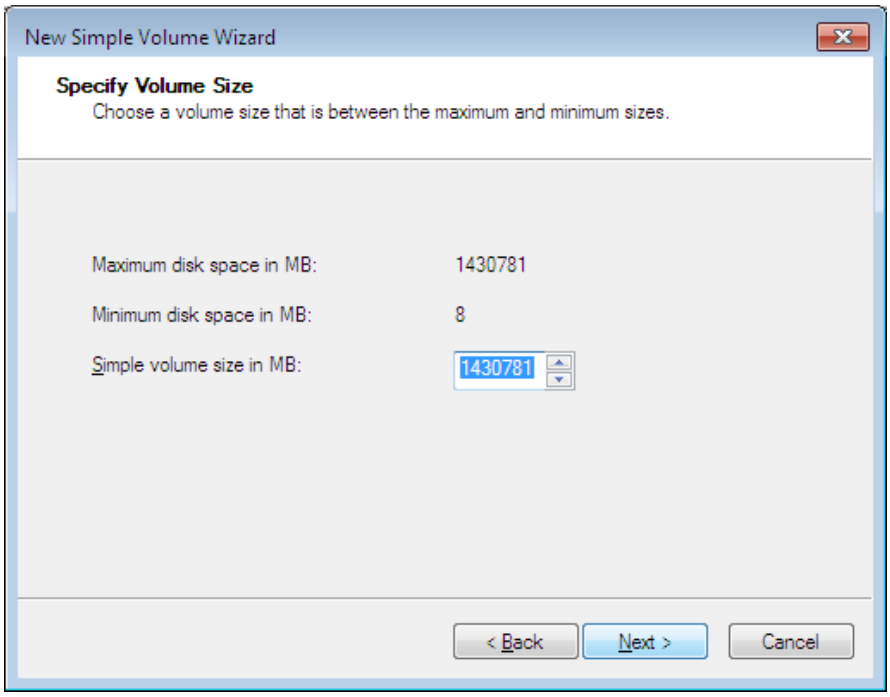
②Select Disk Management from Storage sub-menu. Find the target DISK and right click to choose New Partition



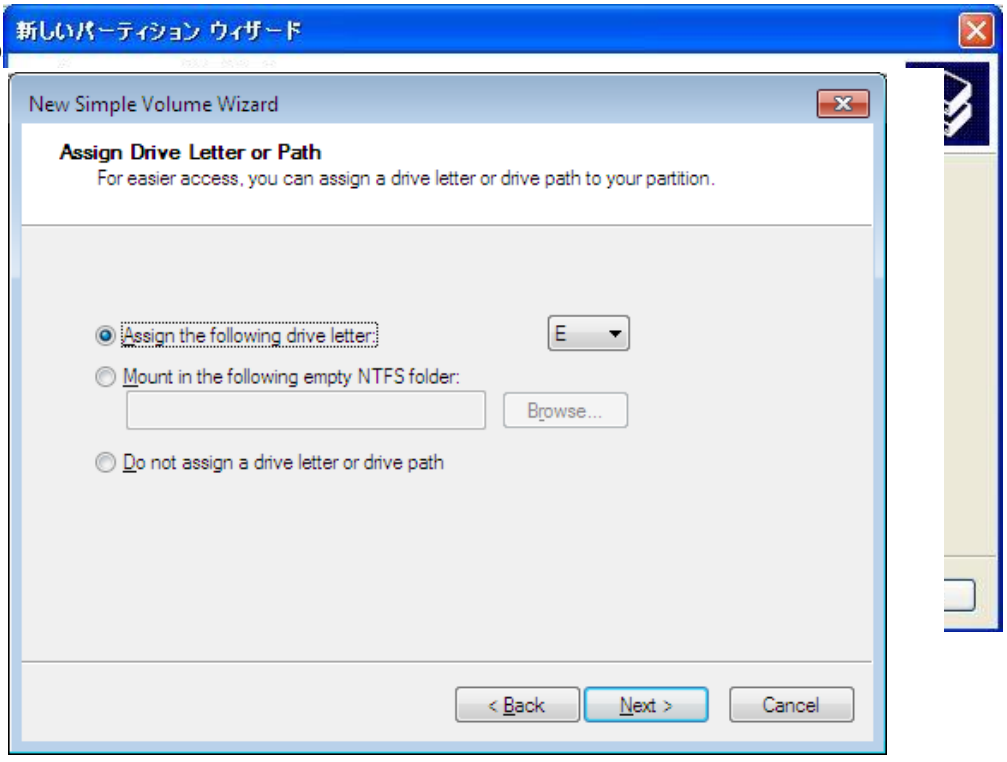
③Click

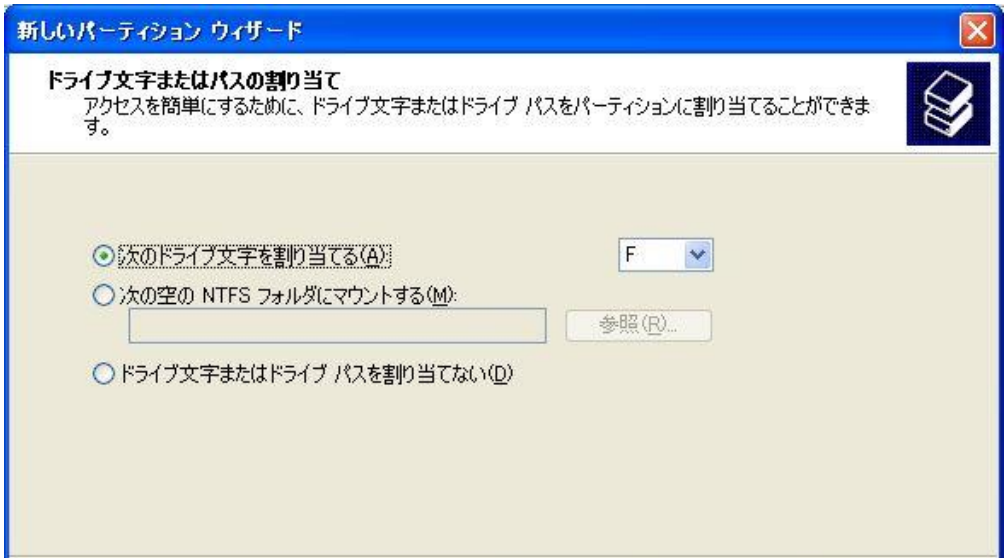

コンピュータの管理
New Simple Volume Wizard
Welcome to the New Simple Volume Wizard
This wizard helps you create a simple volume on a disk.
A simple volume can only be on a single disk.
To continue, click Next.
< Back
Next >
Cancel

④Input size of the partition and click on Next

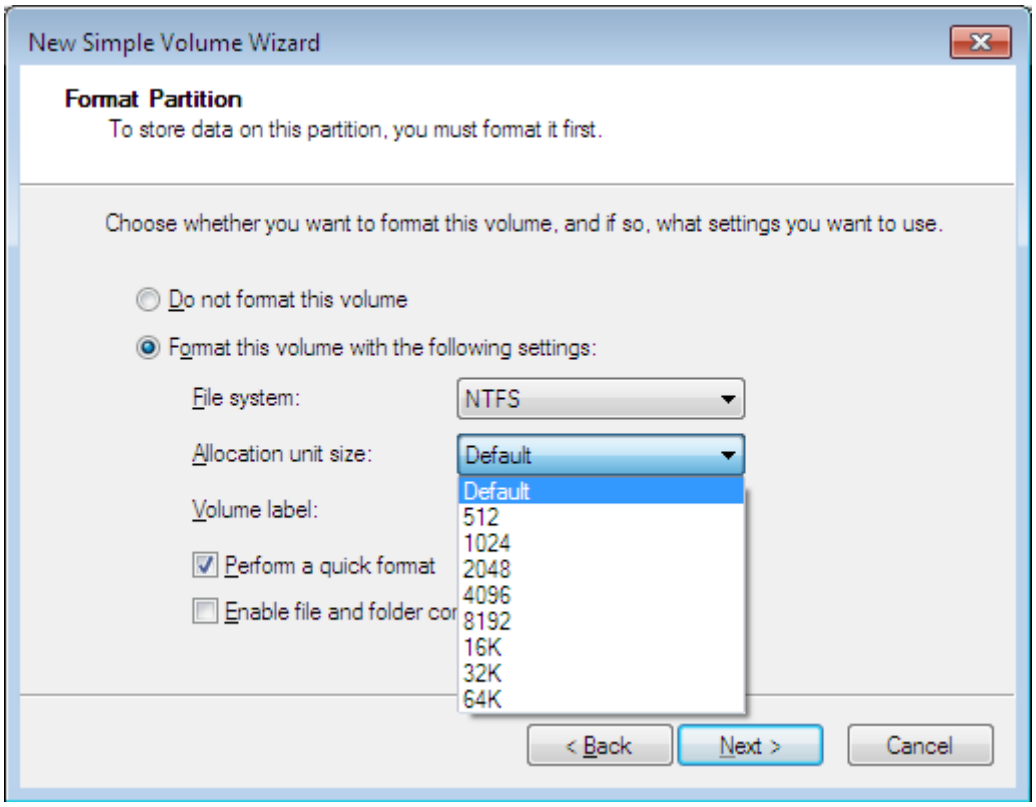

New Simple Volume Wizard
Specify Volume Size
Choose a volume size that is between the maximum and minimum sizes.
Maximum disk space in MB: 1430781
Minimum disk space in MB: 8
Simple volume size in MB: 1430781
< Back
Next >
Cancel

⑤Choo

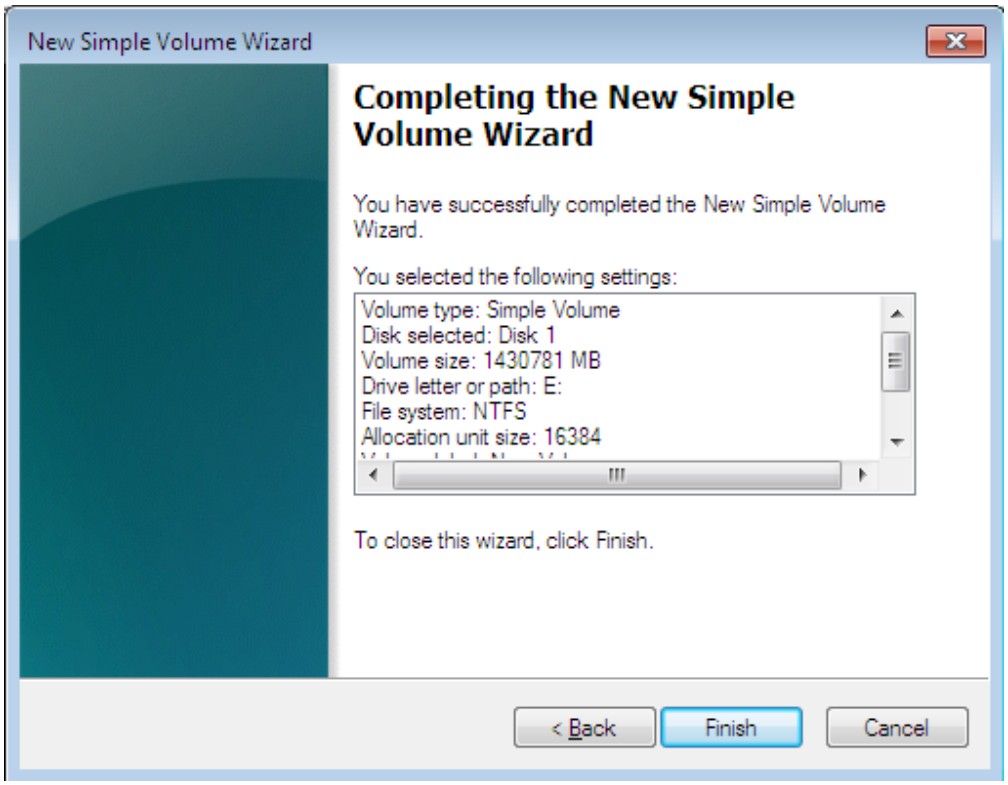

新しいパーティション ウィザード
New Simple Volume Wizard
Assign Drive Letter or Path
For easier access, you can assign a drive letter or drive path to your partition.
Assign the following drive letter: E
Mount in the following empty NTFS folder:
Browse...
Do not assign a drive letter or drive path
< Back
Next >
Cancel



⑥Select to Partition with below setting and choose to change allocation size from the pull down manual(Here 2048 for example))



⑧Optionally choose Quick Format and compression


New Simple Volume Wizard
Completing the New Simple Volume Wizard
You have successfully completed the New Simple Volume Wizard.
You selected the following settings:
Volume type: Simple Volume
Disk selected: Disk 1
Volume size: 1430781 MB
Drive letter or path: E:
File system: NTFS
Allocation unit size: 16384
To close this wizard, click Finish.
< Back
Finish
Cancel

⑨Click on Finish to confirm the completion

4. To use SNMP MIB for Status Monitor

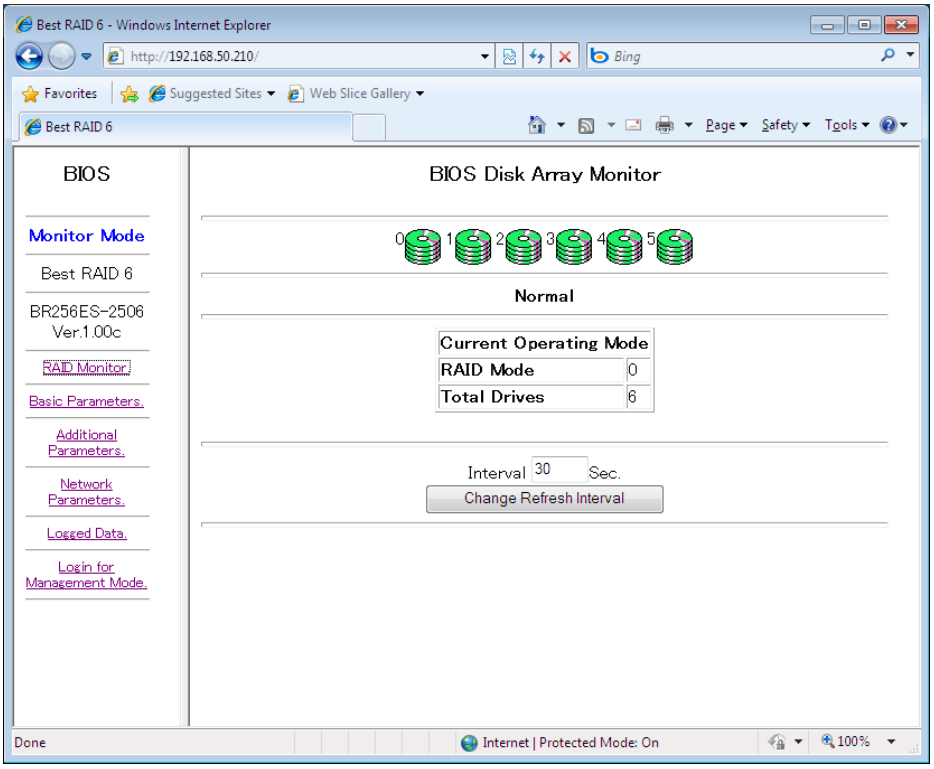
1． Overview

This section will only explain SNMP usage for disk array device.

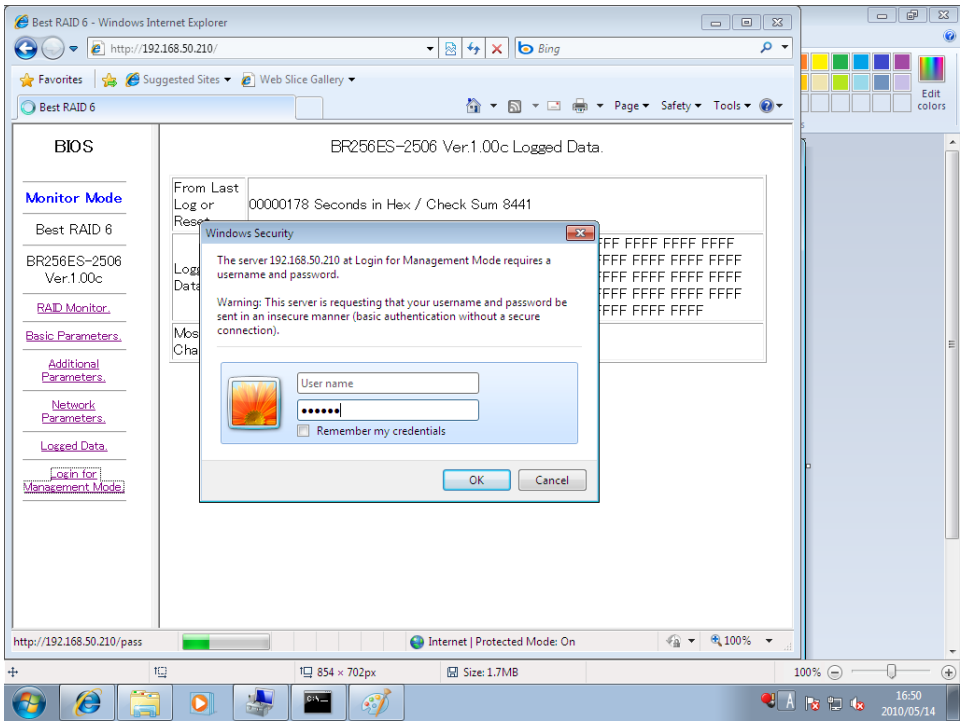
2 . Setup Parameter (SNMP)

Based on pre-defined status criteria, the disk array device can be monitored via network.

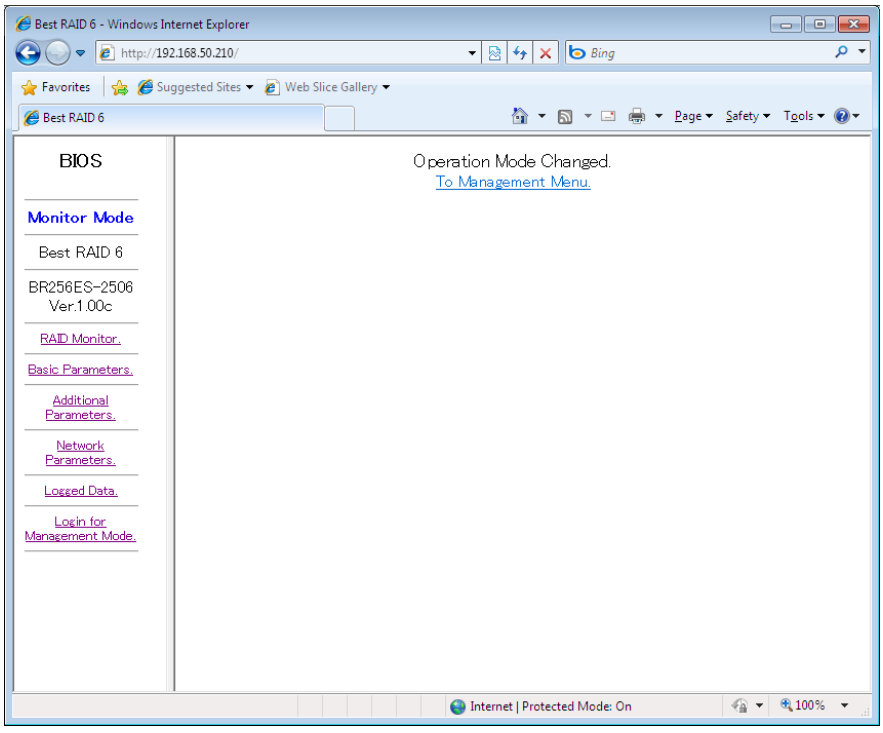
① Launch the web browser with IP of BR256



② It is necessary to log into Management Mode to change SNMP parameters.

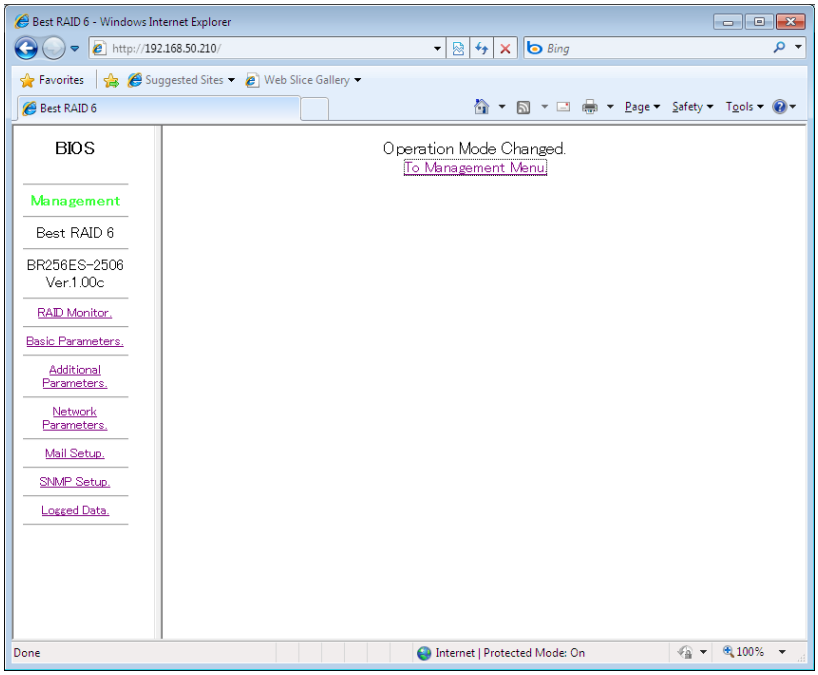

Best RAID 6 - Windows Internet Explorer
http://192.168.50.210/
BIOS
Monitor Mode
Best RAID 6
BR256ES-2506 Ver.1.00c
RAID Monitor.
Basic Parameters.
Additional Parameters.
Network Parameters.
Logged Data.
Login for Management Mode.
BR256ES-2506 Ver.1.00c Logged Data.
From Last Log or Reset
00000178 Seconds in Hex / Check Sum 8441
Windows Security
The server 192.168.50.210 at Login for Management Mode requires a username and password.
Warning: This server is requesting that your username and password be sent in an insecure manner (basic authentication without a secure connection).
User name
Remember my credentials
OK
Cancel
Internet | Protected Mode: On

＜Input user name and password to enter Management Mode＞
Default Password: “passwd”



＜Operation Mode Changed＞

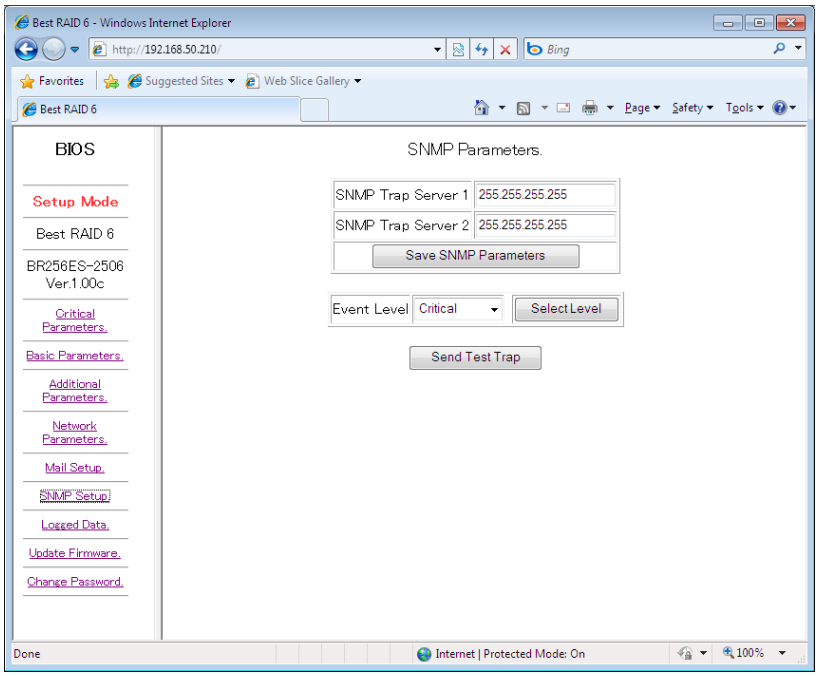
③Click「To Management Menu」when Operation Mode Changed page is shown



＜Management Mode page＞

You can start setting SNMP parameter

④ Click on **[SNMP Setup]**



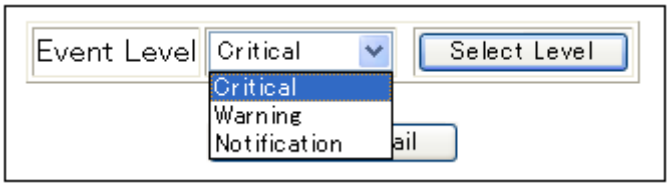
※An error message will be popped up if you are not in Management Mode.

⑤Setup IP address of your SNMP server on「SNMP Trap Server 1/2」. If server is not located within LAN, please input same IP address of your Gateway.

⑥Click on

to save your change.

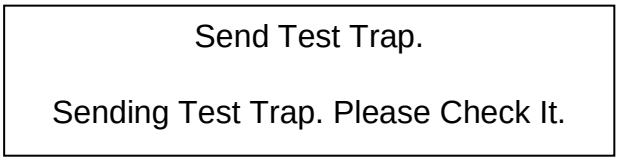
⑦Setup the level of status monitor. Total there are three categories explained as below



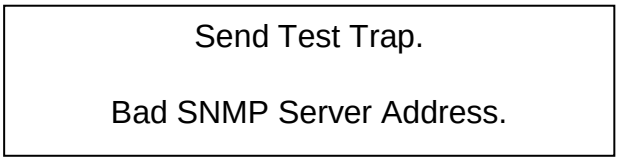
Level	Importance	Example
Notification	Low-High Importance	Power On
Warning	Medium-High Importance	End of Recovery
Critical	Only High Importance	System Down

⑧Click

after you choose level. Below message will be shown. And please refer to the status monitor section for confirmation.



＜Succeed＞



＜Failed＞

3. Method to display SNMP status monitored

①Bring up SNMPc Management Console

②Once returning to parameter setup screen, click Send Test Trap after configuration of server address and monitor level. Pink texts shown are the result of the test

	Info	07/15/2010	09:33:57	
	Info	07/15/2010	09:33:57	
■	Normal	07/15/2010	09:33:57	localhost
■	Normal	07/15/2010	09:34:02	localhost
	Normal	07/15/2010	09:34:02	localhost
	Warning	07/15/2010	09:49:55	192.168.50.223
	Info	07/15/2010	09:51:59	localhost
■	Normal	07/15/2010	09:52:24	localhost
	Warning	07/15/2010	09:57:54	192.168.50.210
■	Minor	07/15/2010	10:10:44	192.168.50.210
■	Minor	07/15/2010	10:11:17	192.168.50.210
■	Minor	07/15/2010	10:11:32	192.168.50.210
■	Minor	07/15/2010	10:12:41	192.168.50.210

3:57		SNMPc JAVA Server Started
3:57		SNMPc Server Started
3:57	localhost	Trend Report Agent Connected to Server
4:02	localhost	Discovery/Status Agent Connected to Server
4:02	localhost	User Administrator at 127.0.0.1 Login OK
9:55	192.168.50.223	Cold Start
1:59	localhost	User Administrator at 127.0.0.1 Logout
2:24	localhost	User Administrator at 127.0.0.1 Login OK
7:54	192.168.50.210	Cold Start
0:44	192.168.50.210	enterprises.29621.0.6 [1] enterprises.29621.1.9.9 (Octet String): Test of Send Trap
1:17	192.168.50.210	enterprises.29621.0.6 [1] enterprises.29621.1.9.15 (Octet String): Fan Unit Down [2
1:32	192.168.50.210	enterprises.29621.0.6 [1] enterprises.29621.1.9.20 (Octet String): One Drive Down [2
2:41	192.168.50.210	enterprises.29621.0.6 [1] enterprises.29621.1.9.2 (Octet String): Recover Finished

※Actual result was shown in one screen instead of separation into two
※The example shows Test and One Drive Down status

4. Log Details

・when it was changed to patrol mode

```
ExPtrLapAround              OBJECT-TYPE
        SYNTAX          OCTET STRING
        MAX-ACCESS        read-only
        STATUS          current
        DESCRIPTION
                "The Patrol Operation was lapped Around the hole disks."
        ::= { biosEventLog 1 }
```

・Recovery was completed

```
ExRecoverFinish       OBJECT-TYPE
        SYNTAX          OCTET STRING
        MAX-ACCESS        read-only
        STATUS          current
        DESCRIPTION
                "The Recover of Disk was finished."
        ::= { biosEventLog 2 }
```

・Test completion of SNMP trap

```
ExTestTrap            OBJECT-TYPE
        SYNTAX          OCTET STRING
        MAX-ACCESS        read-only
        STATUS          current
        DESCRIPTION
                "The Test of Trap operation."
        ::= { biosEventLog 9 }
```

・Power down

```
ExPowerDown           OBJECT-TYPE
        SYNTAX          OCTET STRING
        MAX-ACCESS        read-only
        STATUS          current
        DESCRIPTION
                "The Power unit failed down."
        ::= { biosEventLog 10 }
```

・Fan Failed

```
ExFanStop             OBJECT-TYPE
        SYNTAX          OCTET STRING
        MAX-ACCESS        read-only
        STATUS          current
        DESCRIPTION
                "The Fan unit was Stopped."
        ::= { biosEventLog 15 }
```

・One Drive Down

```
ExOneDown             OBJECT-TYPE
        SYNTAX          OCTET STRING
        MAX-ACCESS        read-only
        STATUS          current
        DESCRIPTION
                "The One Drive Unit was Down."
        ::= { biosEventLog 20 }
```

・Two Drive Down

```
ExTwoDown               OBJECT-TYPE
        SYNTAX          OCTET STRING
        MAX-ACCESS       read-only
        STATUS          current
        DESCRIPTION
                "The Two Drive Units were Down."
        ::= { biosEventLog 21 }
```

・System Down

```
ExSystemDown            OBJECT-TYPE
        SYNTAX          OCTET STRING
        MAX-ACCESS       read-only
        STATUS          current
        DESCRIPTION
                "The System Level Drive Units were Down."
        ::= { biosEventLog 30 }
```

Best Energy and Space Saving Best RAID
Portable RAID 6, 2.5"HDD×6・Desktop Model

BR256

－ eSATA+USB3.0 model －

【 User Manual 】

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